

Program of Activities of The Chicago Academy of Sciences

Vol. 1.

January 1930

No. 1.



The Chicago Academy of Sciences is situated in Lincoln Park, and as it is centrally located in a thickly settled portion of Chicago, it is ideally placed for a natural history museum. It was founded in 1857 and incorporated under the laws of the State of Illinois in 1859. It was organized "to promote and diffuse scientific knowledge," and to encourage in all ways possible, an interest in the sciences. Its entire collection was destroyed by the Chicago fire, but a new stimulus was given to the work of the Academy when, through the generosity of Mr. Matthew Laflin, the present building was erected.

The Chicago Academy of Sciences

FOUNDED IN 1887
LINCOLN PARK AT CLARK AND CENTER STREETS
CHICAGO

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AUDUBON SOCIETY LECTURE

Professor A. A. Allen of Cornell University, one of the foremost students of birds in this country, will talk before The Illinois Audubon Society on "The Home Life and Courtship of Birds" on Wednesday evening, January 29, at 8:15 P. M. All members of the Academy and their friends are invited as guests of the Society.

CHANGES IN THE CONSTITUTION

At the special meeting of the Academy held on November 1st, certain articles of the constitution and by-laws were amended or otherwise modified, among which were those relating to the classes of membership in the Academy. The Academy now has Active, Sustaining, Contributing, Associate, Teacher, Junior, Honorary, Corresponding, and Life Members, Fellows, Patrons, and Annual Patrons.

Scientific societies may now form Sections of the Academy upon approval of the Board of Scientific Governors, "and may hold meetings, and may maintain an office in the Academy building. Each section shall have full power to make its own constitution and by-laws, and to formulate all rules and regulations regarding the election of its officers, the amount of its dues, its qualifications for membership, etc., providing only that such constitution, by-laws, rules, and regulations, do not violate the constitution and by-laws of the Academy."

MAMMAL SURVEY

In a survey now being conducted by The Chicago Academy of Sciences, Mr. Edwin Komarek of the Academy staff, and Mr. D. A. Spencer of the Biological Survey, have collected nineteen species of mammals within the Chicago Area in the last two months. This region includes the area within fifty miles of Chicago, from the sand dunes of Indiana to the border of Wisconsin, and west from Lake Michigan to Aurora.

As might be expected, most of the large mammals which once made their homes within the region have long since disappeared, the red fox and raccoon, being the largest found to date. The Illinois skunk, woodchuck, and oddly enough, the opossum, are common. The latter species was found by Mr. W. I. Lyon at Waukegan, by Mr. Mooney at Deerfield, two specimens by Mr. Evans at St. Charles, and two at Mineral Springs, Indiana. The list includes: mink, New York weasel, Alleghenian least weasel, muskrat, common and short-tailed shrew, house, jumping, prairie, and meadow mouse; mole pine, prairie white-footed, and northern white-footed deer mouse; striped and Franklin's ground squirrel, northern gray and western fox squirrel, gray chipmunk, and the cottontail rabbit. According to Mooney, farmers near Half Day, Illinois, have the skin and skull of a badger captured there only a few weeks ago.

The survey seems to be showing, already, that the native animal population of even as thickly settled a region as the Chicago Area is greater than most people imagine. One would naturally think that the animal life of the region would be exterminated by the advance of man, and for the most part this is true of the larger mammals. Some of the smaller species, however, seem to be more common in certain parts of the area than formerly. A good example of this is the mole pine mouse which was comparatively rare 80 years ago but is now more numerous. In similar cases in other parts of the country, this seems to be due to the reduction of the natural enemies by man. Whether such is the case here is uncertain. Perhaps further study will reveal the answer.

A short-time expedition of two weeks will be made by Mr. Komarek and Mr. Spencer into southern Illinois and Kentucky where collections will be made of the mammals which the Academy does not have well represented in its study exhibits. Of the smaller mammals it is hoped that the cotton mouse, golden mouse, rice and wood rats will be secured, and among the larger, the raccoon, mink, otter, and bobcat.

This is the first issue of the Program of Activities of The Chicago Academy of Sciences, supplanting the News Bulletin, formerly printed to announce the lecture programs of the Academy.

SATURDAY TALKS FOR BOYS AND GIRLS AT 10:00 A. M.

March 1—Taxidermy

Earl G. Wright

Would you like to know how the animals which you see in the museums are made to appear so life-like; how they are skinned and the skins "stuffed;" and how they are preserved to last for years in their glass cases? Mr. Wright will tell you about it.

Illustrated with Lantern Slides and Motion Pictures

March 8—Backyard Adventures with Birds

Alfred M. Bailey

The pictures which Mr. Bailey will show you were taken by himself in various places not far from Chicago, and show birds which most of us can see if we keep our eyes open and our other senses alert.

Illustrated with Lantern Slides and Motion Pictures

March 15—A Summer with the Menominee Indians

Edwin Komarek

Not far from Chicago lives a tribe of Menominee Indians who pursue their lives, in many ways much as did their ancestors long ago. Mr. Komarek will tell you how these modern Indians secure their food from forest and field, and how they work and play.

Illustrated

March 22—Star Gazing

Wallace F. Worthley

Have you ever wondered about the stars, what they are and where they are, and why they change from month to month? Have you ever wondered about the sun and the moon; about Mars and Venus, about Jupiter and Saturn? If you are a Boy Scout, Girl Scout, or Camp Fire Girl you will find this talk most interesting.

Illustrated with Motion Pictures

March 26—Louisiana Wild Life

Alfred M. Bailey

Bird life is still very abundant in some parts of Louisiana, especially in the migration season when hundreds of thousands of birds are ready to wing their way across the Gulf of Mexico or northward up the Mississippi Valley. The pictures to be shown were taken on one of the museum's expeditions into the South.

Illustrated with Motion Pictures

April 5—Fun with the Microscope

Clarence L. Holtzman

Mr. Holtzman will demonstrate, with the aid of a microprojection machine, the tiny animals of pond and stream magnified to great size. Live animals and microscopic slides will be used.

WINTER PROGRAM OF LECTURES

The Academy announces a series of free public lectures during the winter of 1930 at the Assembly Hall, Sundays at **3:00 P.M.**

January 5—Carlsbad Cavern, New Mexico Mr. Russell T. Neville
Kewanee, Illinois

Illustrated

January 12—Louisiana Wild Life Mr. Alfred M. Bailey
Director, Chicago Academy of Sciences

Illustrated

January 19—Life in Australia Dr. Griffith Taylor
Professor of Geography, University of Chicago

Illustrated

January 26—Cancer and its Control Gilbert Fitz-Patrick, M.D.

Illustrated

February 2—The Grand Canyon of the Colorado Dr. C. O. Schneider
Winnetka, Illinois

Illustrated

February 9—Hearing and its Conservation A. A. Hayden, M.D.

Illustrated

February 16—Fossil Hunting in the Karroo Desert, South Africa
Dr. Alfred S. Romer
Professor of Paleontology, University of Chicago

Illustrated

February 23—Diet for Health in Childhood Maurice L. Blatt, M.D.

March 2—The Arctic Summerland Mr. Carveth Wells
Explorer

Illustrated

March 9—(Subject to be Announced) N. S. Davis III, M.D.

March 16—With Pinchot in the South Seas Mr. Howard Cleaves
Explorer

Illustrated



OTTER

(*Lutra canadensis*)

One of the most interesting of all mammals of North America is the otter. It is restricted almost entirely to a water habitat in which medium it is the embodiment of grace and beauty of movement. Although on land it is rather slow and awkward, in the water, due to its wonderfully muscled body, webbed feet and long tail, it swims with speed and ease, pursuing and catching fish, which is the chief item of its diet. The otter is also fond of frogs and shellfish, and is said to eat waterfowl, eggs, and poultry at times when other food is scarce.

The home of the otter is dug in the bank of lakes or rivers, and has several entrances, one of which usually opens under the water. The young, usually two, are born in April and stay with their mother through the summer and fall months.

That most wild animals play is a fact well known to all. The otters' form of amusement consists in sliding or tobogganing, either upon mud or snow. With their fore feet bent backward, they slide upon their bellies, head foremost down the slippery slide, sometimes for fifty feet or more. They have been seen to play in this fashion for long periods of time. Audubon has thus written of their play: "The otters ascend the bank at

a place suitable for their diversion and sometimes it is very steep, so that they are obliged to make an effort to gain the top; they slide down in rapid succession where there are many at a sliding place. On one occasion we were resting on the bank of Canoe Creek, a small stream near Henderson, which empties into the Ohio, when a pair of otters made their appearance, and not observing our proximity, began enjoying their sliding pastime. They glided down the soap-like, muddy surface of the slide with the rapidity of an arrow from a bow, and we counted each one making twenty-two slides before we disturbed their sportive occupation."

The fur of the otter is very thick and close, and has been much in demand because of its color, texture, and beauty.

The illustration is from a photograph of the new habitat group recently installed in the museum by Mr. Wright. A fine adult female, received through the kindness of Mr. H. J. L. Stark of Orange, Texas, is shown with two young, the latter having been a gift of Mr. G. H. Laflin many years ago. The background illustrates a typical waterway near Palos Park, west of Chicago.

THE ILLINOIS AUDUBON SOCIETY

The Illinois Audubon Society has become affiliated with the Academy and has formed a "Section of Popular Ornithology." All members of the society automatically become Associate Members of The Chicago Academy of Sciences, unless they already hold a higher class of membership. The Audubon Society will have its offices in the Academy, and hold its meetings in the lecture hall. The officers of the Academy believe this is an important step in the growth of the institution; they feel that the Academy should be the meeting place for Chicago scientists, and for those interested in natural history. The Illinois Audubon Society has long held an important place in the field of popular ornithology, and in arousing sentiment in the interests of conservation.

CORRESPONDING MEMBERS

At a recent meeting of the Board of Scientific Governors, four men were appointed Corresponding Members of The Chicago Academy of Sciences in recognition of their interests in science and conservation. They were: Mr. Charles J. Belden of Pitchfork, Wyoming, Mr. E. A. McIlhenny of Avery Island, Louisiana, Captain William Lea, and Mr. H. J. L. Stark of Orange, Texas.

Mr. Belden has been actively engaged in arousing sentiment for the protection of antelope. There has been an open season on these fine animals in Wyoming, and hundreds were killed last fall. Mr. Belden has made excellent motion films of the antelope in action, and members of the Academy were shown one reel at the last meeting. "The Orphans of the Plains" was a valuable contribution to photographic life history studies.

Mr. E. A. McIlhenny is a sportsman-naturalist who has traveled extensively. His Avery Island heronry is unique in the annals of conservation for he has an artificial pond on his estate at Avery Island, Louisiana, which is the home of thousands of the beautiful southern water birds. Mr. McIlhenny started protecting these birds when plume hunting was at its height, and this place of refuge undoubtedly aided in saving the snowy egrets from extermination.

Captain William Lea has been instrumental in the saving of the last large colony of roseate spoonbills in Louisiana. Bird Island is a wooded "island" in the marsh in Cameron Parish, Louisiana, and when the spoonbills were driven from their old nesting sites along Black Bayou, they found a refuge on Mr. Lea's property. Many other species use this little bird paradise as a nesting place, including anhingas, Ward's herons, Louisiana herons, snowy and American egrets.

Mr. H. J. L. Stark has extensive tracts of marsh land in southern Cameron Parish, bordering the Gulf of Mexico. This area of 350,000 acres is the center of the wintering grounds of many thousands of northern breeding waterfowl, and in addition, is the home of thousands of fur bearing mammals.

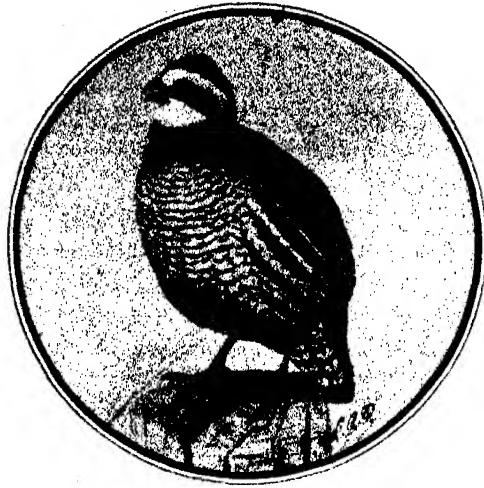
MUSEUM ACTIVITIES

Construction work has started on the new cases which are to complete the Chicago Environs Series. The same type of construction will be followed in these groups as in the exhibits now completed, and the background will be photographic representations of the region north of Chicago. A detailed account of the plans for the new group, with photographs of the sketch models, will be shown in a future number of the Program of Activities.

Mr. Wright has modeled and mounted a group of black bear which will be installed on the second floor of the museum within the next month. The habitat groups are being systematized so that the mammals of the various families will be shown with related forms, and it is hoped that the exhibit will include a complete representation of all the mammals known to have occurred in the Chicago Region, with the exception of the bison, antelope, and elk.

In addition to the building of the large habitat groups, other cases are being remodeled to exhibit the systematic collection of birds of the Chicago Region. It is planned to show all species, with plumage variations when possible, which have been recorded from this area.

The collection of colored photographic transparencies of the trees and wild flowers of Chicago is being enlarged. This series is of great value to students of botany, for the photographs portray the flowers in their natural habitat. Miss Grace Harch is in charge of the work.



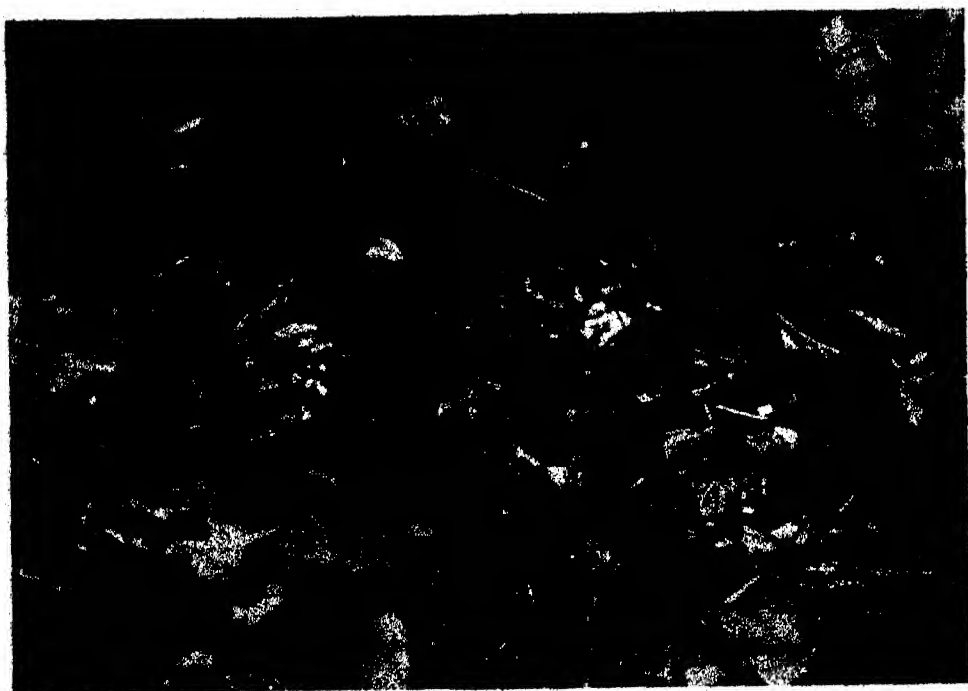
NOTES FROM
The Illinois Audubon Society

NOTE ON THE WOODCOCK CARRYING YOUNG

By Fred S. Lodge

• That the woodcock is in the habit of carrying its young has been recorded a number of times. Forbush states that the matter has been reported by many observers with many variations, from riding on the mother's back to being carried in her claws. Bent mentions only one specific report: there the young were carried between the adult's legs. However, the exact method of procedure has seldom been recorded. It was my good fortune last May to see the performance in detail.

We were spending the week end at Klinger Lake near Sturgis in Southern Michigan. A very severe storm arose while we were breakfasting in the woods, and after the downpour had somewhat slackened I elected to tramp through the swampy woods, in search of the painted trillium said to be blooming there. Deep in the woods, just where the ground began to rise from the swamp, I flushed a woodcock almost at my feet. The bird flew only about fifty yards and alighted. Thinking a nest or young might be near, I leaned against a tree and after a few moments of quiet, "squeaked" a few times. Almost instantly a faint peep answered, and looking closely I made out a single young squatting in the dead leaves within a few feet of where I was standing. The little fellow, about the size of a newly hatched chick, was wet and shivering and when disturbed, tottered along in a weak, uncertain manner, wings spread for balance, for all the world like a ballet dancer on tiptoe.



PROTECTIVE COLORATION IN YOUNG OF WOODCOCK

As I picked him up he continually emitted a faint peeping sound. I replaced him in the leaves and resumed my station against the tree and waited. The youngster remained motionless where placed, but continued his plaintive cry. Within five minutes an old bird, presumably the one I had flushed, flew in a circle completely around where I was standing against the tree, and alighted about a foot from the young, and within six feet of my position. Looking at me intently all the time, she sidled and backed toward the little fellow till he was directly between her feet. All this time she had been standing fully erect. She now squatted down till the tarsi were flat on the ground, body being at right angles to me though the bill was pointing directly at me. The feet and legs were moving slightly all the time. The "heels" apparently being brought almost together and the toes touching or almost interlaced. She moved her wings, raised slightly, settled again obviously for readjustment, again rose with the youngster firmly seated on her feet, with his little legs dangling below, his body held loosely in the angle of the adult's legs. Her flight was low, slow, and labored. She alighted some hundred and fifty yards away in the deeper swamp.

After searching carefully for signs of a nest or other young without success, I followed up the line of flight of the pair. Although I had carefully marked the spot I was unable to find any further trace of them.

THE AUDUBON SOCIETY AND THE ACADEMY OF SCIENCES

By Jesse L. Smith

The Board of Directors of The Illinois Audubon Society has some important announcements to make to the members of the Society, and the one that should come first is to explain why these announcements appear in the Program of Activities of The Chicago Academy of Sciences.

At a meeting of The Chicago Academy of Sciences, Nov. 1 1929, the constitution of that organization was amended to permit scientific societies to form Sections of the Academy, the members of such societies to be enrolled as Associate Members of the Academy. Other features of the amendment of its constitution defined the relationships that were to be assumed and the privileges accorded a scientific society within the organization of the Academy, and these commended themselves so well to the members of the Board of Directors of The Illinois Audubon Society that they filed an application for admission of the Society to the Academy of Sciences as the "Section of Popular Ornithology." The application was formally approved at a recent meeting of the Scientific Governors of the Academy, and as this Program of Activities is sent to press, the new arrangement is about to go into effect.

Each member of The Illinois Audubon Society is now an Associate Member of The Chicago Academy of Sciences, and will receive a membership card to that effect. Each member will be on the mailing list of the Academy and will receive its announcements and bulletins. The Society assumes all associate membership fees.

The Society is authorized to hold meetings in the Academy building and to maintain an office and keep its property there. It is to be allotted space in the quarterly notices of the Academy for its own notices, as in the present number, and it has been assured that its activities in popularizing a knowledge of ornithology will meet with the cordial approval of the officers of the Academy.

In its new environment, The Illinois Audubon Society is free to carry on as before. It is to retain its original name and program. Its aim will still be to widen the scope of its activities and service to include every portion of our state. Its meetings for the transaction of business or for popular lectures may be restricted to its own members. Other members of the Academy of Sciences may be admitted to its scientific meetings as guests. In the proceedings of the Academy of Sciences our Society will be referred to as the Section of Popular Ornithology, a title which it may affix to its official title or not, as it chooses.

The fortunate provision for a meeting place for our members in the Chicago area only throws into clearer relief the lack of any provision for gatherings of our members at other centers in our state. This has often

been given consideration, and indeed, the committee on open meetings and lectures, of which Mr. W. I. Lyon is chairman, is at this time giving the subject special attention. It promises a special report in the near future. It may be possible to serve some areas this year through the work of our field agent.

This is the place for the important announcement that Mr. Orpheus M. Schantz has been made special field agent of the Society to conduct campaigns for the conservation of bird life in selected areas as directed by the executive committee of the Society. The committee has been given an appropriation and authority to co-operate with groups or organizations in financing such campaigns. Mr. Schantz is a well known lecturer, and his travel and natural history lectures are in demand. He is reserving some of his time for his campaigns in the field, however, and the executive committee invites applications for his services.

Professor C. W. G. Elfrig of Concordia College, River Forest, has been a member of the Board of Directors of our Society for many years and needs an introduction here only in his new capacity of President of the Society. Professor Elfrig is a widely known ornithologist and has made extensive studies of bird life in various areas of our country. In the reorganization of the committees of the Society, the executive committee has been given much responsibility and Mr. Fred S. Lodge of La Grange is here introduced as its chairman. The Director of The Chicago Academy of Sciences, Alfred M. Bailey, is a member of the committee as are also Fredrick H. Pattee, Chas. O. Decker, and W. I. Lyon. The committee on publications is responsible for the material in this portion of the Academy's publication allotted to our Society. Jesse L. Smith of Highland Park is chairman of the committee. Miss Catherine Mitchell continues, as for so many years in the past to serve as Secretary. Her name has become a synonym for devotion to the enterprises of the Society.

In the forthcoming Annual Bulletin of The Illinois Audubon Society, further details of the reorganization of the committee work of the Society will be given. It is hoped that this bulletin will be issued about January 15. Its principal theme is to be seasonal, our winter birds receiving special attention. Reports of the occurrence of bird life have been solicited from observers in various portions of Illinois, and a winter census is being taken.

The Society will retain its principal office at 137 S. LaSalle Street until the expiration of its lease, May 1. It is hoped, however, that those of our members who are not familiar with the Academy of Sciences will not wait until that time to visit the Academy. These, and all other members are requested to visit the office of the secretary of the Academy and register their names and the date in the register of the Audubon Society which will be left there for that purpose. Our out-of-town members will be well repaid if in their visits to Chicago, they reserve ample time to visit the Academy and study its valuable collections.

Program of Activities

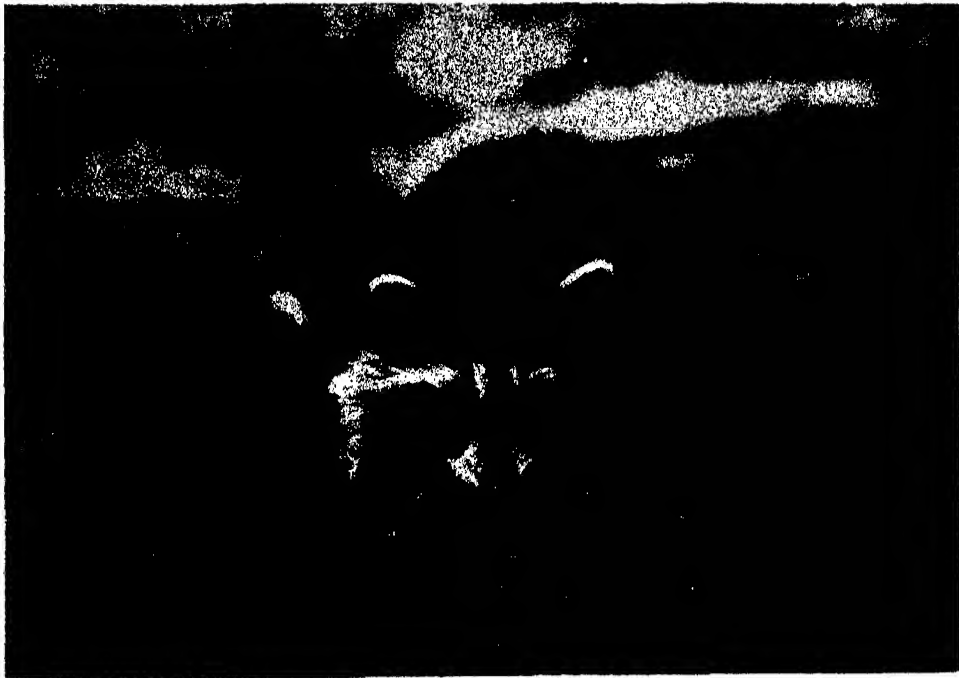
of

The Chicago Academy of Sciences

Vol. 1.

April 1980

No. 2.



EASTERN RACCOON

Procyon lotor lotor

The raccoon was known to the early French settlers in our southern states as "Chat sauvage" or wild cat, though of course he is not a cat, nor is he very ferocious. It is said that the name raccoon comes from the Indian "arrathkune" or "arathcone." Its scientific name (*Procyon lotor*) refers to its curious habit of washing its food in pond or stream, or in its water pan if tamed, before eating it. The coon is rather easily raised in captivity, and fur farmers have had some success in this venture. It is still a fairly common animal in Illinois.

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THE ANNUAL MEETING

The Annual Meeting of the Academy will be held on Monday evening, May 12th, at 8:15 o'clock in the Academy lecture hall. Announcements will be mailed to all members a week before the meeting, and it is hoped that as many as possible will attend and bring their friends. The lecture of the evening will be "The Bird Life of the Forest Preserves," by Mr. A. M. Bailey.

It seems fitting that the films of the bird life of Chicago should be shown at this time. The Academy staff, with the financial aid of the Chicago Daily News, has been filming many of the interesting species of birds which occur in the nearby forest preserves. These motion pictures are the first of a series of the animal life of the Chicago region for the Academy's film library. There is an abundant bird life in this region, and views of the home life of many of our common birds will be shown. Among the interesting species which were filmed were the brown thrasher, robin, towhee, song sparrow, field sparrow, horned lark, long-billed marsh wren, king rail, least bittern, pied-billed grebe, and piping plover.

There will be a short business meeting, an election of officers, and a discussion of the expansion program of the Academy. The officers feel that the Chicago Academy of Sciences holds a valuable place in the growth of the city of Chicago, and that its scope of activities should be increased.

EASTERN RACCOON

Procyon lotor lotor

The raccoon is truly American, being found in no other part of the world, and is so distinctive in color and markings that it can not be mistaken for any other carnivore. It has often been called the Little Brother of the Bear because of its build, and its flat, smooth feet. This is one of seven species and subspecies, the others being: Florida, Texas, California, Southeastern, Pacific, and Desert raccoon. The Eastern raccoon is found in the United States east of the Rocky Mountains, from southern Ontario and Manitoba to Florida.

The raccoon, or "coon," as it is known all over the United States, lives in woodlands in the vicinity of streams and marshes, and makes its home in hollow trees or logs. It is a nocturnal animal, being rarely seen during the day, but as soon as night comes on, it descends from its aerial home to the ground to search for food. Like the bear, it is omnivorous, eating frogs, fish, shell-fish, small mammals, birds, eggs, reptiles, insects, fruits, nuts, and grain. The raccoons, whatever their species, have the curious habit of washing meat of all kinds before eating it, and captive coons have been known, also, to wash bread, fruit, and nuts in a similar way. The food is held in the front paws and soused in the stream or drinking pan until it is well soaked, and is then eaten. They have been known to go hungry for days when this habit is denied expression.

Raccoons are easily tamed and make interesting, though mischievous pets. When allowed to roam too much at large where poultry and farm-yards are within reach, they become errant thieves, eating the eggs, killing the poultry, and robbing right and left. In fact, their character seems to be rather humorously exposed by the presence of the little black mask across the eyes, giving them somewhat of an inquisitive, cunning, and thievish look.

In the southern part of their range, the raccoon does not always hibernate, but farther north, about three months of the winter are spent in a dormant state. Five or six young are born in April or May.

Coon hunts, especially in the south, have provided sport for many generations of hunters. The hunts are usually at night and specially trained hounds are used to tree the animal. As a fur bearer, the raccoon has been a favorite since early pioneer days, providing the coon-skin caps worn by the early settlers; skins were also used as a medium of exchange in the Mississippi Valley. Today, raccoon coats worn by both men and women testify to the high favor in which Bre'r Coon is still held by those who can afford to pay for his high priced pelt.



PRAIRIE HORNED LARK

Otocoris alpestris praticola

The prairie horned lark belongs to the same family as the skylark of Europe, famous in literature for its lovely song and lofty flight. It is the only member of its family which nests in this area, and resembles the migratory horned lark very closely, but may be told from it by its smaller size, lighter on the throat, and the absence of a yellow line over the eye.

It arrives usually in late February or early March, and is the first of our small song birds to nest. Two broods are often raised, and sometimes there are three. The young seem to remain with their parents the greater part of the season, and in the fall large flocks of from fifteen to twenty birds may be seen preparing for migration.

The bird has been accused of injuring grain crops by eating the sprouting and ripened grain, but there is little evidence for this assertion. Examination of many birds' stomachs shows that they are of great benefit to the farmer because of the consumption of such weed seeds as pigweed, bitterweed, amaranth, sorrel, etc. Although the lark is primarily a seed eater, about 10% of its food consists of insects and spiders. Small grasshoppers, leaf-eating beetles, and the larvae of many insects are eaten as a variation to its seed diet.

LOUISIANA FIELD TRIP

A trip to the coastal marshes of Louisiana, and the shell keys of the Gulf of Mexico is planned for the latter part of May and a portion of June by members of the staff. Birds and mammals will be secured for the collections of the Academy, and an extensive series of motion film will be made for the Film Library.

Mr. Robert Maestri, Commissioner of the Louisiana Department of Conservation, has offered his co-operation in securing photographs and specimens of the animal life of that interesting region. Louisiana is a wonderful bird state, with great colonies of sea birds and marsh nesting species. Through the courtesy of Mr. Maestri, members of the staff will be able to visit these colonies of thousands upon thousands of skimmers, terns, and brown pelicans. At the same time motion pictures will be made of the oyster, fish, and shrimp industries. These films will be made available to the students of the public schools of Chicago, and, through the Louisiana Department of Conservation, to the schools of New Orleans.

Mr. Joseph Leiter has volunteered the use of his property at the mouth of the Mississippi, which is near one of the greatest breeding grounds of southern wild fowl, and Mr. E. A. McIlhenny has kindly offered the use of cabins on his estate at Avery Island. Life history photographs will be made of the snowy egret, Louisiana herons, and other interesting water birds which nest in such great numbers. Then the members of the party plan to collect and photograph in Cameron Parish on the properties of Mr. William Lea and Mr. H. J. L. Stark. Roseate spoonbills, American egrets, and anhingas are among the interesting water birds that will be photographed, that Chicago school children may see these unique birds in their home surroundings.

Reptile life is abundant in Louisiana lowlands, but contrary to general belief, there is very little danger from such animals. The alligator is an inoffensive creature which merely wants to be undisturbed, and makes an ideal subject for the motion picture camera. Mr. Stark has a vast area of land along the gulf coast, which is the home of thousands of these reptiles, and some time will be spent in securing life history photographs.

Louisiana has an interesting mammalian fauna, but very little work has been accomplished among the small forms since Audubon's time. One of the members of the party will devote his time to an extensive study of these animals.

The officers of the Academy feel greatly indebted to Messrs. Maestri, Leiter, McIlhenny, Lea, and Stark for their co-operation which will give Chicago school children a knowledge of one of the most interesting regions of the country.

NEW MEMBERS

The growth of and interest in the Academy is manifest in the number who have recently been elected to membership. The following persons have become affiliated with the Academy:

Life Members

Eugene M. Bornhoft	Charles H. MacDowell
Casper Brauer	Stuyvesant Peabody
Mrs. Fredrick W. Clark	Melville N. Rothschild
Mrs. A line V. Cheever	Harold H. Swift
Mary Pomeroy Green	G. F. Swift
Samuel Insull	Edgar J. Uihlein
Mrs. Louis E. Laflin	L. L. Valentine
Katherine Lefens	John P. Welling

Contributing Members

Mrs. John J. Borland	Dr. Frank L. Fortelka
George W. Dixon	Mrs. Lucile R. Hibbard
R. M. Eastman	Edmund A. Russell
Dr. Edward D. Howland	

Teacher Members

Martha J. Imlah	Celia Berlizheimer
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Sustaining Members

Mrs. Edward E. Ayer	Fred M. Davis
Arthur W. Armstrong	Mrs. Joseph Deutsch
Mrs. Edwin M. Ashcraft	Mrs. Edgar T. Donohue
Mrs. Mary Horton Bronson	Mrs. Dean H. Dresser
Mrs. Alfred V. Booth	Mrs. George Dasch
Mrs. J. P. Buenemann	George C. Dent
E. J. Block	Mrs. Joseph Doetsch
Charles Bohasseck	Mrs. Fred W. Farehnfeld
Mrs. Leonard Bloomfield	Lester B. Fulton
Charles Bosch	Paul Godehn
Marie H. Biggs	Mrs. Arthur T. Galt
Dr. Charles W. Bibb	Mrs. F. W. Geisler
Elizabeth Browning	Mrs. Stanley Gibson
Mrs. Gertrude S. Crowell	Harriet F. Gilchrist
Mrs. J. Sidney Condit	Dr. I. J. K. Golden
William A. Converse	Maude R. George
Dr. George H. Coleman	Louise O. Grotenhuis
Mrs. Chilton C. Collins	Mrs. Barney Gisnet

Andrew Hummeland
Mrs. George Hohmann
Margit Hochsinger
James L. Houghteling
Mrs. H. N. Hudson
A. Rebecca Hufmeyer
Richardt Hansen
Herman M. Hoelscher
Mrs. Estha F. Hiner

Ruth J. Jarratt
Mrs. R. King Kauffman
Mrs. Edward Loitz
Mrs. W. T. Leman
Mrs. Miriam Ormsby Mark
H. Barry McCormick
Orval Simpson
Mrs. George T. Smith
Seymour Wheeler

Corresponding Members

William E. Lea
Charles J. Belden

E. A. McIlhenny
H. J. L. Stark

The support and growth of the Academy is dependent upon members and friends. The classes of membership are: Annual Patron (\$1000.00 annually), Patron (\$1000.00), Fellow (\$500.00), Life (\$100.00), Contributing (\$25.00 annually), and Sustaining (\$10.00 annually).

DAILY BIRD EXCURSIONS BEGIN ON APRIL 1.

School children, members of the Academy and their friends, are again to have an opportunity to participate in the daily bird walks in Lincoln Park to observe the spring migrants as they arrive in Chicago on their journey northward. As in former years, the walks will begin at 7 A. M. and will last for an hour or an hour and a half, during which time instruction will be given in the identification of the birds seen. As most of the birds known to visit the Chicago Area may be seen in the museum habitat exhibits, and the new systematic collection recently installed, it is comparatively easy for one to become acquainted with the birds of the region, and the methods of identification in the field. The Children's Science Library contains many books about birds, an extensive picture collection, and several hundred stereopticon slides in color.

The Academy's Bird Excursion Card, giving the average date of arrival of most of the land birds observed in Lincoln Park during the spring migration, will be sent free to those interested.

In order that the groups taking these walks may get the most out of them, the size of each party will be limited to twenty. Appointment must, therefore, be made in advance by calling the museum, Diversey 5871. Mr. Wallace F. Worthley will again conduct the trips.

DR. HENRY J. COX

Dr. Henry Cox, noted weather chief, and a Fellow and Life Member of the Academy, died at his home in Chicago, January 7th. As President of the Board of Scientific Governors, Dr. Cox was a most active and generous worker, and "when his fellow members lagged, he spurred them on, and insisted on their active and constant interest as manifested in good works."

Professor Cox, after his graduation from Harvard in 1885, served in the signal corps of the United States Army where he became affiliated with the weather bureau to finally become the senior meteorologist of the country. He came to Chicago in 1894 as assistant in the department and remained here the rest of his lifetime. His service to Chicago and the middlewest was of inestimable value, and his excellence and accuracy in forecasting Chicago's weather placed him in the forefront of his profession.

He was an active member of many societies, President of the Geographic Society for many years, member of the Association of American Geographers, and Fellow of the American Meteorological Society. In 1928 he received the Gold Medal of the Geographic Society of Chicago, for "eminent achievement in meteorology and for priceless service in the upbuilding of the Society."

CHARLES F. SCHILDEIN

Charles F. Schildein, for many years policeman and guard of the museum and loyal employee of the institution, has resigned from his duties because of ill health. From the very beginning he took a most active interest in his work, suggesting improvements where he thought they were needed, and demanding carefulness and efficiency from his subordinates in the care of the building.

PEPOON'S FLORA OF THE CHICAGO REGION

Pepoon's Flora of the Chicago Region may still be obtained from the office of the Academy. This is the only book published which deals with the plant life of the area in its entirety. Six distinct floral regions are discerned by the author, and each is treated in a separate chapter of the 136-page descriptive text. In the catalog that follows, consisting of more than 400 pages, over 1900 native plants are listed, to the majority of which are given one or more common English names. The book is beautifully illustrated with 7 full-page maps, and 115 photographs. 25 simple keys make possible the ready identification of most of the plants listed.

The Flora of the Chicago Region, by H. S. Pepoon, *Price \$3.50*



NOTES FROM
The Illinois Audubon Society

THE PRAIRIE CHICKEN AND THE QUAIL

Two of our most valuable game birds are in need of protection, and a movement has been started by conservationists to place a ten-year closed season on the prairie chicken. The Officers of the Illinois Audubon Society are in full accord with the necessity of giving the prairie chicken a respite from the guns of sportsmen, and they believe that the bobwhite should be included in this constructive program. There is no doubt that the prairie chicken is becoming very rare in regions where it once flourished, and that the bobwhite is not able to hold its own against the thousands of sportsmen who take the field each fall. A closed season for the prairie chicken is not a matter of sentiment, but of necessity, if it is to be saved from extinction within the borders of Illinois. The bobwhite is not so rare, for it has received the friendship of thousands of farmers throughout the state. They have refused gunners permission to kill, and so bobwhites have held their own to some extent. One farmer remarked last fall that he allowed no one to kill his quail. "Why not?" a member of the society asked. The farmer was rather sheepish as he replied, "I dunno, I guess it's because I like the little cusses."

Let us have more conservationists like this farmer who are willing to give the bird life of our state a place of refuge. After all, being a sentimentalist is no crime, if a little common sense is used.

OPEN MEETINGS OF THE ILLINOIS AUDUBON SOCIETY

January

Dr. A. A. Allen, Professor of Ornithology at Cornell University, gave a very interesting lecture at the open meeting of the Society in the Academy lecture hall on January 29. His topic, "Home Life and Courtship of Birds" was an appropriate one for the large audience of enthusiastic bird students. Mr. Allen is recognized as one of the foremost bird photographers of the country and his lecture was illustrated with excellent pictures. The motion film of the drumming of the ruffed grouse was exceptionally fine; his pictures of duck hawks upon their nest were made with a picturesque waterfall in the background, — one of the most beautiful settings for a falcon picture imaginable.

April

As the Audubon notes are going to press, Mr. W. I. Lyon is attempting to arrange a program for this month. It is hoped that Mr. Walter E. Hastings of the Michigan State Department of Conservation, may be persuaded to lecture and show his wonderful photographs, motion pictures and stills of the birds of Michigan. Mr. Hastings has traveled over the entire state, and has secured many thousands of feet of fine bird film. Notice will be sent to all members as soon as arrangements are made.

May

The migration of birds is at its height during the fore part of this month, and members of the Audubon Society will be afield to record the birds as they arrive. The Audubon meeting will be held at the time of the Annual Meeting of The Chicago Academy of Sciences, in the lecture hall of the Academy, on May 12, as announced on the second page of this Program of Activities. Mr. Bailey will show the motion pictures made this past season, and will talk on "Birds of the Forest Preserves." Several members of the Society have helped in securing these films which were financed by the Chicago Daily News, among them being, Mr. F. S. Lodge of La Grange, Mr. W. I. Lyon of Waukegan, and Mr. J. L. Smith of Highland Park. Many species of our common birds, and some not so common, have been photographed. Some of these films will be released in 16 mm. size for use in Chicago schools, through the Bureau of Visual Education.

In this connection,— Illinois Audubon Society members are found in all parts of the state. It is desirable that as complete a file of motion film of the state birds be secured as possible, and members are urged to write or telephone to the Audubon headquarters at the Academy, if they find nests suitable for photographic purposes. The nest and eggs of a woodcock are especially desired, so that the nesting birds may be studied and photographed during the period of incubation.

June

Dr. Alfred O. Gross is continuing his work with the prairie chicken of Wisconsin, in behalf of the Department of Conservation of that state. He is an authority on the grouse of North America and has made a special study of the heath hen; his report was published in the *Wilson Bulletin* of June, 1929. Dr. Gross has been asked to give a lecture to the members of the Society for the early June meeting, and he has expressed his willingness, if arrangement can be made without conflicting with his work in Wisconsin. Announcements will be mailed to members at a later date.

MEADOW LARK WINTERING

Two meadow larks spent the winter in Glen Ellyn, DuPage County, Illinois, on the premises of Harry G. Aberdeen. They roosted at the base of a bush, a honeysuckle, I believe, against the south foundation of his house. The birds stayed near an open ventilating window, apparently for warmth, but often times, when snow banked high, they were completely concealed within their burrows. The birds subsisted on bread crumbs, white and whole wheat, furnished by Mr. Aberdeen.

Benjamin T. Gault

COURTING PERFORMANCE OF THE MARSH HAWK

That the male marsh hawk (*Circus hudsonius*) performs aerial feats for the benefit of the female, is probably well known, but I observed these antics for the first time on Turtle Marsh near Delavan, Wisconsin, on February 23, 1930. It was a sunny, warm day and many marsh hawks were seen. Several times I saw a slate-backed male mount to a height of 300 to 500 feet, and then swoop down, almost to the ground, with great speed; the wings partly closed, and then, when the hawk nearly touched the earth, it would turn, with wings still partly closed, and shoot upward until it nearly reached its former height. As it reached the height, it moved very slowly, and gracefully turned over on its back, with belly in the air, and then, after completing the backward loop, he would take a few short, quick strokes of his wings, and dart downward at an angle which crossed his line of ascent, about half way from the ground to the top of the loop. This courtship flight would continue until the hawk had made eight or ten loops, and had moved across the marsh a distance of possibly two hundred yards. Then the male would fly slowly along over the top of the tall grass to where the female was on a post or marsh hummock, and the pair would fly off together.

At times, at the top of his loop, the hawk would turn over sideways instead of making the complete backward somersault. I saw the performance by three different birds during the day, and in each case the performer was an adult male.

E. G. Wright

ANNUAL AUDUBON OUTING

For several years the Illinois Audubon Society has held an outing in the woods some time in May, aiming to have the date at the height of the warbler migration. This has quite infallibly proven the pleasantest event of the Society's year. This year the day is set for Saturday, May 17, and all the members and friends of the Audubon Society and the Academy of Sciences are invited to join. The train leaves the Union Station over the Burlington at 1:30 and arrives at Riverside half an hour later. The leader will leave a commutation ticket and the fare is to be paid on the train. Bring lunch, cup, and spoon, and if possible a pair of bird glasses, and be prepared to walk four miles through the beautiful forest preserves along the Desplaines River.

Do not be discouraged by bad weather for it usually rains and the harder it rains, the more successful the occasion. The bird life of the Chicago Region is a wonderful one, when the migration is at its height, and all who take the spring hike are assured a pleasant time.

Mrs. E. T. Baroody

PRAIRIE CHICKEN AT GLENN ELLYN.

The occurrence of a prairie chicken near Glenn Elynn is so unusual that I should like to record two birds which were reported from within the limits of the town on February 20th, by Harry G. Aberdeen. The birds were flushed from among the weeds of a subdivision. Mr. Aberdeen has been an observer for twenty years, and is well acquainted with this species as well as partridges and pheasants, and there can be no doubt of his identification. Mr. Aberdeen reported a small covey of approximately a dozen birds which was observed near his home during the winter of 1928-9. He could not give the exact date.

Benjamin T. Gault

NOTES

The publication committee desires notes pertaining to Illinois birds for this quarterly and the bulletins of the Society. Members are urged to send their records to the Illinois Audubon Society, at its headquarters in The Chicago Academy of Sciences. The Society's headquarters will be moved from 137 South La Salle Street on May 1st and members are invited to visit the Academy. Miss Clark, office secretary of the Academy, will be in charge of the Audubon desk, in the absence of Mrs. Baroody and Miss Catherine Mitchell.

Program of ~~Activities~~

of

The Chicago Academy of Sciences

Vol. 1.

July 1930

No. 3.



THE PIPING PLOVER

The glistening sand and pebble beaches are the resting places of a multitude of bird wayfarers on their way to their northern breeding grounds, or enroute from their summer homes to their winter resorts. But not all the shore birds pass on, for the piping plover remains throughout the summer. Their nests are mere depressions in the light colored sand, and their large eggs are protectively colored.

(Photographs by Alfred M. Bailey)

The Chicago Academy of Sciences

FOUNDED IN 1887

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CHICAGO

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THE BIRD WALKS

Mr. Worthley, who has been conducting the early morning bird excursions in Lincoln Park for many years, reports a very successful season for 1930. In spite of the fact that many mornings were wet and cold almost 800 bird students were happy and willing to bestir themselves so early in the morning to make the 7 o'clock trips. Some came from far out on the south side and not a few from outside the city. The greater proportion of these avid ornithologists were students of the near-by high schools, but many adults, both young and old, could have been seen on the walks as well. Most of our Chicago citizens are unaware of the tremendous number of migratory songsters which enter Chicago parks to stop for a few hours or days on their journey northward. More than 100 species were observed in Lincoln Park from April 5th to June 1st.

HONORARY CURATORS APPOINTED

At the last meeting of the Board of Trustees and Scientific Governors, five Honorary Curators of the Academy were appointed:

Dr. John R. Ball	Invertebrate Paleontology
Dr. Adolf C. von Noe	Paleobotany
Dr. Herman S. Pepoon	Botany
Dr. Frank J. Psota	Entomology
Mr. Tappan Gregory	Mammalogy

THE ANNUAL MEETING

The Annual meeting of the Academy was held in the lecture hall on Monday evening, May twelfth. Mr. Bailey, the director, delivered the lecture of the evening, "The Bird Life of the Forest Preserves," illustrated with motion films taken by the staff of the museum.

At the business meeting preceding the lecture the results of the election of officers for the ensuing year was made known. The members concurred in every instance with the nominees proposed by the nominating committee, and the officers elected are:

Dr. Henry C. Cowles	President
Dr. W. H. Haas	Vice-President
Dr. Edmund Andrews	Second Vice-President
Dr. Nathan S. Davis III	Secretary
Mr. Henry S. Henschen	Trustee
Mr. Francis R. Dickinson	Scientific Governor
Mr. Burt A. Massee	Scientific Governor

Dr. Davis, the Secretary, reported in part as follows: "At a special meeting of the members on November 1st, 1929, certain articles of the Constitution and By-laws were amended, or otherwise modified, among which were those relating to classes of membership in the Academy. This has resulted in an increased interest, and many new friends have been enrolled. Including the members who have been voted in tonight, there have been added in the past year twenty new life members, thirteen contributing, seventy-five sustaining, eleven active and teacher, and four corresponding.

"Scientific societies may now, with the approval of the Board of Scientific Governors, form sections of the Academy. The Illinois Audubon Society and The Chicago Entomological Society have become affiliated and will hold their meetings and have their offices in the Academy building. All the members of these two organizations have automatically become associate members of the Academy.

"We feel that the Academy should be a meeting place of scientists and nature lovers of Chicago. The affiliation of The Illinois Audubon Society and The Chicago Entomological Society is the first step in that direction. We believe it would be a distinct advantage to these scientific societies to be associated with the Academy, and to the Academy to have them here.

"Of the many natural history museums in the country, the Academy's museum ranks within the first nine in point of attendance, and with the proposed new building, will rank within the first five."



THE PIPER OF THE DUNES

The dunes of the Chicago Region are famous for their beautiful wild flowers and interesting bird life. Many species of birds make their summer homes among the wooded parts, and others use the wind-whipped and wave-washed beaches as their resting places while on migration. Not all the birds of the open beaches are migrants, however, for the little piping plover nests upon the broad expanse of glistening sand and pebbles, and the melodious, piping note is a characteristic one of the dunes region.

The piping plover was formerly a common bird along Lake Michigan, but the advance of civilization, if summer cottages and bathing beaches are a sign of civilization, has limited the breeding areas until the little pipers are woefully few. They are small, pearl-gray plovers, sandpipers if you like—with black belts across their chests, and great brown eyes circled with lids of light brown; they are modest, retiring chaps, and their only wish, during the month of June, is to be unmolested. They scurry along ahead of one, with drooping wings and dragging feet, if the nest is near, and they utter piteous notes as though in throes of agony. Small boys cannot resist chasing them, and so are quickly decoyed away from the nest and eggs.

We found such a nest along the sandy shores above Waukegan, at Beach. This bit of storm-blown woods is well known to nature lovers, for there is found the ground juniper, the fringed gentians, and the prickly pear. Vesper sparrows build their nests under the trailing branches of the juniper, while many cedar waxwings nest among the stunted trees.

It was June 18th that we found a nest with four large spotted eggs laid in the depression in the sand. The lupines were blooming profusely, their blue blossoms showing brightly against the drab background of sand in the sheltered spots in the woods, but on the beaches there was little growth except coarse grasses. Our photographic blind was erected, and the motion camera placed inside that we might make life history pictures for the film library of the Academy. How accomodating our subjects proved! They circled the blind, calling plaintively. In a few moments, convinced that all was well, one of the pair cautiously advanced, stood for a moment over the eggs, and then settled carefully upon them. The scene was recorded in motion films, and now the story will be shown to thousands of school children.

We kept the nest under observation daily for the next three weeks. There was a great change in the wild flowers during that time, and, conspicuous among the blossoms at the time of our last visit were the wax-like flowers of the prickly pear. And a different sight greeted us upon the beach, for instead of four eggs in the sandy hollow, we found but one, while three fuzzy youngsters streaked down the shore like wind-blown thistle down. They were corralled and placed with the egg while motion pictures were made. The parents hovered anxiously about, and Mr. Wright stretched upon the sand with outstretched arm, holding the young plovers in the palm of his hand. Both old ones promptly climbed upon the improvised nest, one to shelter the young and the other to incubate the egg.

NORTHWESTERN UNIVERSITY COLLECTION

Many valuable accessions have been received during the past year, but the most noteworthy is the zoological collection from Northwestern University. Due to lack of facilities at the university the authorities have deposited the collection as a permanent loan. This means that specimens which have great value from a historical standpoint will be available to all naturalists. There are many birds collected by Robert Kennicott, the first director of the Academy,—the *Carolina parakeet* from southern Illinois and passenger pigeons from the campus of Northwestern University—specimens dating back to 1850. There were approximately 1000 bird skins and many mammals, as well as a great number of reptiles preserved in alcohol. These specimens will be of great interest to the students of the fauna of the Chicago region. Arrangements were made through Dr. W. H. Haas and President Walter Dill Scott.

A glance at the data on many specimens shows that former officers of the Academy had taken an active interest in the collection. Among the collectors were Robert Kennicott and Drs. N. S. Davis and Edmund Andrews. Dr. Oliver Marcy was instrumental, to a large degree, in building the Northwestern collection, and in preserving these specimens which are of such value to naturalists of this region. Dr. Marcy was born at Colrain, Mass. on February 13, 1820, and graduated from Wesleyan University in 1846. He came to Illinois in 1862 as Professor of Physics and Natural History, and was curator of the Natural History collection from 1871 to the time of his death, March 19, 1899.

AVERY ISLAND, LOUISIANA

The call of the mockingbird and the clear notes of the Carolina wren rise above the dripping of the steady rain upon the roof of our field headquarters on Avery Island. Grim skies, with storm-whipped clouds seem to promise a day in camp, and to present an opportunity to send motion films to be developed; it is just as well, for the past days have been full of activity, with many opportunities for photographing and collecting. From our little cabin in its picturesque setting among live oaks with their gray mantles of Spanish moss, we can see a little artificial lake with its growth of button-bush and willow. Even at this distance and in this dull light, each bush seems to be crowded with white blossoms, but occasionally, one of these light spots rises from its resting place, and sails away on immaculate wings. We are looking upon one of the greatest examples of conservation in the world, for these white birds we see crowding the bushes of the little pond, are snowy egrets, the beautiful "plume" birds. Thousands are nesting and rearing their young.

Many other species of birds inhabit this sanctuary, among them being the Louisiana, little blue, and little green herons, the anhingas, and gallinules. The shores of the pond are lined with bamboo thickets and flower gardens on one side, while on another,--within thirty feet of many nesting birds, is a railroad track. The herons refuse to rise from their nests when the trains pass.

During former years, when it was fashionable to wear feathers on hats, many of our most beautiful birds were exterminated by feather hunters. The birds were killed during the spring of the year when they were at the height of their plumage, and as that is the breeding season, the young were left to starve in the nests. Mr. E. A. McIlhenny, who owns a great portion of Avery Island, has been a nature student since boyhood. His home is in the south, and he has had an opportunity to observe the disappearance of the birds he knew so well. He captured some fledglings of the snowy egret, eight or ten in number, in the near-by swamp, and kept the birds in cages along a small creek near his home. Building a dam across the stream, he formed an artificial lake of a few acres in extent.

The baby herons grew tame, and were liberated in the autumn. A few returned the next spring and built their nests in the haven offered them, and as year followed upon year, the colony became larger. Many other species were attracted until now, each bush is crowded to capacity with the platform-like nests of the herons. Nesting material is at a premium, and it is necessary for Mr. McIlhenny to supply branches for the birds to use in building their nests, otherwise they would tear up the bushes and steal the nests of their neighbors.

An island in Louisiana may be a shell key in the gulf, a clump of trees in the marsh, or an elevated piece of ground which rises above the

surrounding lowlands. So Avery Island is an island in name only, being a series of rounded hills rising to a height of 150 feet, while the neighboring country is typical marshland, prairie, and dense swamps of cypress, tupelo, gum, and palmetto thickets. A great salt dome underlies a major portion of the island, and one of the largest salt mines in the world is in operation. The shafts have been sunk to a depth of 550 feet, and the galleries run for 1700 feet.

From our cabin we can see the top of the mine; to the left are Mr. McIlhenny's factories, and we can hear the whistling of trains,--and yet, even though surrounded by present day activities, these thousands of egrets and other herons are nesting as abundantly as when this region was unknown to white man. It is an example of adaptation, and a lesson in tolerance.

The marsh and swamp country surrounding Avery Island is also rich in wild life. A small white-tailed deer inhabits the open marsh and is extremely abundant, but owing to the nature of its home, it is rarely seen. This beautiful little animal was recently described as a new form, and named in honor of Mr. McIlhenny from specimens collected by Mr. Bailey during the fall of 1925. Bear are so numerous in the cypress swamps that their well beaten trails may be followed through the dense growth of palmetto, but, like the deer, the bear are rarely seen because of the thick vegetation. The Louisiana black bears are large, short-haired beasts with rather amiable dispositions; they raid the cane fields and corn patches occasionally, but otherwise prefer the solitude of swamps. Fur bearing mammals--racoons, mink, muskrats, and a few otter still dwell along the banks of the bayous, and there are many species of birds to delight the visiting naturalist. The southern pileated woodpeckers and the Florida red-shouldered hawk dwell among the great cypress trees, while the open marshes are the feeding grounds of the thousands of water birds which nest within the sanctuary. Every morning and every evening there is a continuous flight of birds to and from the bird haven, and then, just at dusk, hundreds of birds may be seen at once returning to their nests from distant marshes; they fly high in large flocks until they finally reach their colony; then they spiral down from the heights to their place of safety among the button-bushes and willows of Willow Pond.

(The members of the staff have been working in southern Louisiana during the months of May and June, securing specimens of animal life and making motion films for the film library. Mr. McIlhenny, a corresponding member of the Academy, has given his co-operation and has provided quarters and men to help, and has had blinds prepared, that the photographic work may proceed without loss of time. Mr. Bailey has written the above note from the field, and an account of the whole trip will be included in the next Program of Activities.

The expedition is financed jointly by one of the Scientific Governors of the Academy and the Chicago Daily News.)

NEW MEMBERS

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Olaf B. Johnson

George H. Jones
Robert C. Stirton
R. Douglas Stuart

Teacher Members

Dr. John R. Ball
Glenn L. Hackett

Thomas Mc Cann
Prof. A. C. von Noe'

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Mr. and Mrs. Karlton Hackett
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William S. Holabird
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James P. Hume
Mrs. William C. Jacobs
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Louis L. Joseph
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Rev. F. G. Ostrowski
Mrs. Robert F. Palmer
Orval Simpson
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NOTES FROM

The Illinois Audubon Society

BIRD SANCTUARIES IN THE FOREST PRESERVES

In the organization of the forest preserves a very important work remains to be done, and that is to set aside within each forest preserve an area suitable for a bird sanctuary. Such areas should of necessity be closed to the public for all time, and admission for any purpose jealously guarded by the administration. It is believed that the officials at present in charge of the preserves are friendly to a plan of this sort, but it is very likely that they would prefer to take action of so far-reaching a nature only after it is demonstrated that there is widespread approval of such a program. It was proposed that The Illinois Audubon Society get behind a movement to foster this work. Dr. C. W. G. Eifrig, president of the Society, is to act as chairman of a survey committee to make note of suitable areas in the several portions of the forest preserves which would lend themselves to the sanctuary project, and which should be recommended to the attention of the superintendent and commissioners of the forest preserves. Dr. Eifrig will appreciate suggestions from any of our members. Please address him at 1029 Monroe Ave., River Forest, Ill.

A CAT LICENSE LAW

Several year ago the Village of Riverside passed a cat license law, but the general public was not wide enough awake to the need of such a law to make it easy to enforce. Everyone loved his cat and did not see why fifty cents a year should be paid on it, even though he was perfectly willing to pay the dog license he had been paying for years.

Gradually, but oh, so gradually, the citizen is waking up to the fact that it is much better to pay fifty cents a year to protect his cat from the stray cats which are making their homes in cozy corners under garages and bushes and having their chief sustenance from the birds which are giving so much pleasure in the garden and in the woods, and also helping the garden and woodland by eating the insects.

The citizen knows that his own cat does not eat birds, and of course the pet cat does not catch nearly as many as if it were dependent upon them for its daily food. It is the cat's nature. It may be only the instinct of play which impels him to chase the birds he finds sleeping in the bushes, while on his nocturnal rambles.

And it is the stray cats from which the law should protect not only the birds, but also the pet cat.

This spring, the Riverside Village Board decided to enforce the old law, and the police are registering the cats at the same time they register the dogs.

About a week after the board decided to enforce the law, an editorial in the Chicago Tribune commended the action most heartily even though in a rather humorous way. This brought forth other editorials and articles of commendation, also letters of inquiry from almost every state in the union, from Maine to California. Many people read then of progressive Riverside, Illinois, who had never known before that there was such a place. Would this not be a good way for every town to put itself on the map?

BREWER'S BLACKBIRD IN THE CHICAGO AREA

The Brewer's blackbird (*Euphagus cyanocephalus*) has been found nesting in southern Wisconsin, but its occurrence in the Chicago region has not been recorded, so far as the undersigned know. This species is difficult to identify because of its similarity with the rusty blackbird, and also because the red-winged blackbirds are so common that a bird student does not observe closely each blackbird seen.

The Brewer's blackbird, however, may not be a rare bird in the region. Mr. W. I. Lyon showed us several nests of blackbirds upon the ground in a little wet area near Zion, Illinois, in the summer of 1929. The birds were very tame, hovering overhead all the time we were in the vicinity, but we could not be sure of their identity. They were either rusty blackbirds or Brewer's, and we believe, without doubt, that they were the latter.

On February 23, 1930, we were walking along Salt Creek, near Camp Remis, just west of La Grange, Illinois, when we saw our first red-winged blackbird of the season. It came flying toward us, singing, and then swerving down creek, alighted on a tree with eight blackbirds which we had not seen. Then, the nine birds took wing directly toward us, and finally alighted within twenty feet of us upon an open, burned area. We were delighted to observe that our flock consisted of a single redwing and eight Brewer's blackbirds. Of the latter there were five males and three females. The bright yellowish eyes of the males were very conspicuous, while those of the females appeared dark.

Fred S. Lodge and A. M. Bailey

AUDUBON BIRD HIKE

The annual bird walk of the Society took place near Riverside on May 17th. Although the weather was not all that could be desired—rather cool and without sunshine—a company of 110 took part. Several were members of long standing, who attended this function for the first time and frankly asserted that they could not afford to miss one in the future. A large contingent was from Bowen High School in Chicago, and that these young people were interested could be seen from the eagerness with which they wrote down the names of birds and, incidentally, the wild flowers seen. A number of wood warblers was seen and admired. A pair of sparrow hawks was observed at the nesting cavity, and a starling or two was seen carrying food for its young. Many common terns were executing their aerial stunts overhead. The rose-breasted grosbeak and the scarlet tanager were greatly admired.

The route followed was from the Burlington station at Riverside, south along the Desplaines River, into the forest preserve, around Mud Lake and to the source of the east fork of the south branch of the Chicago River. This is historic ground, for here Joliet and Marquette in 1678 floated their canoes from the Desplaines into the Chicago River, and here was the famous Chicago portage.

At five o'clock the honking of an auto horn rounded up the hikers to a spot near Mud Lake where our efficient Secretary had caused coffee to be brewed in generous quantity, and here all sat down to lunch. After this was some speech making, and the taking of pictures marked the close of a very successful outing.

MOSQUITO ABATEMENT

Members of The Illinois Audubon Society will please note that at the last meeting of the Directors of the Society, a committee was appointed, with Miss Catherine Mitchell as chairman, to investigate the work of the various groups engaged in mosquito abatement in the Chicago area as well as elsewhere. This committee will need all possible assistance from members of our Society. A similar committee is now at work representing the Friends of Our Native Landscape.

The inquiry, it is advised, should not be undertaken in an unfriendly spirit, but for the purpose of appraising the significance of the work of mosquito abatement and its efficacy under present methods. Questions like these frequently come up: To what extent, if any, does the work of the sprayer destroy valuable plant life and disfigure more or less permanently the natural beauty of the areas treated? Does this work deprive birds of the native shelter of their haunts and possibly entrap bird life to its destruction? Such questions can be answered satisfactorily only after much observation continued throughout the season, and merits the widest possible co-operation of lovers of birdlife and the native beauty of the wild. Each of our members is urged to co-operate in this work as far as opportunity serves. Reports should be sent to Miss Catherine Mitchell, Riverside, Illinois. If any situation appears requiring special investigation, Miss Mitchell and her committee will endeavor to send a trained biologist into the area.

GOLF COURSES AS FOREST PRESERVES

The National Audubon Society has recently published a booklet on the above subject, illustrated with some of Dr A. A. Allen's remarkable bird photographs, which should be in the library of every country club in America. The suggestion is made that golf courses are ideal for bird sanctuaries; hundreds of golf courses are scattered in every state in the Union, and these play grounds are usually wooded, in part, with plenty of water, so they should make places of refuge for the feathered folk. Little effort would be needed on the part of the officers of the clubs, for there are individuals in practically every organization who are interested in birds, and these people would be glad to take the responsibility. The grounds could be beautified with shrubs which attract the birds; houses could be erected and small fountains built in secluded places at no great expense. The members of the club would benefit by having pleasing songsters about them, and a small army of winged helpers ever on the alert to destroy insect pests. The booklet lists many of the species of birds to be found upon golf courses, and gives a brief account of their habits. Birds react to protection, and will soon become tame if food and shelter is provided them.

This suggestion is an excellent one, and it is hoped that members of the Illinois Audubon Society will lend their aid in interesting the officers of their local country clubs. There are many hundred golf courses in Illinois, and practically all of them are fitted for sanctuaries. Members of this society will do a good work if they succeed in arousing the interest of their local organizations in conservation. The booklet may be obtained from the national headquarters at 1974 Broadway, New York.

Program of Activities of The Chicago Academy of Sciences

Vol 1

October 1930

No 4



THE PLUME BIRD

Egretta thula thula

The snowy egret is one of the most beautiful herons. It is a graceful creature of immaculate, white plumage, and its back is adorned, in the springtime, with lacelike, recurved plumes. When all is quiet in the colony, the plumes are practically invisible, but when the herons are angry, or when they desire to display their fine dress for the benefit of their mates, they fluff them out so the threadlike feathers make a striking display.

The Chicago Academy of Sciences

FOUNDED IN 1857

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CHICAGO

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AUTUMN MEETING

A meeting of the members of the Academy will be held in the Lecture Hall on Thursday, October 30, at 8:00 P. M., to review some of the results of the Louisiana Field Trip which was made during the past summer, under the auspices of the Academy and the Chicago Daily News. More than two miles of motion film of the plant and animal life were secured for the Film Library, and several reels will be shown by Mr. Bailey, under the title,

"Filming Louisiana Wild Life"

The films which will be presented at this meeting will be restricted to the life of the coastal plains. The broad savannahs stretching along the Gulf of Mexico are the summer homes of many wild fowl; photographic blinds were erected and life history studies made in motion film of the purple gallinule, the anhinga, Louisiana and little blue herons, the beautiful egrets, and other interesting marsh dwelling species. The two photographs of the snowy egret reproduced in this issue of the Program of Activities, are enlargements from motion film. Reptiles were numerous in many localities, and the photographers accompanied the marshmen on several alligator hunts.

Members of the Academy are invited to bring their friends.

AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during the fall of 1930 at the Assembly Hall, Sundays at **3:00 P. M.**

October 26—Madagascar, the Mystery Island Dr. Ralph Linton

Dr. Linton has a long record in the field of ethnology and anthropology; after work in Guatemala and the South Seas he spent two years in Madagascar. His lecture will treat of his experiences on this little known island.

November 2—Art in Science and Science in Art Mr. Jerome Uhl

Mr. Uhl, a distinguished artist and portrait painter, spent his formative years in Paris studying under the masters of art and portraiture. There is a very definite relationship between art and science, Mr. Uhl believes; he will illustrate his points on canvass.

November 9—Along Italian Trails Dr. Henry C. Cowles

Dr. Henry C. Cowles, the President of the Chicago Academy of Sciences, and Chairman of the Department of Botany at the University of Chicago, will lecture on the plants observed in his wanderings along the beautiful Italian trails, and will tell of the people and their customs.

November 16—Scenes in the Vale of Kashmir Mrs. Laurie R. Frazeur

Mrs. Frazeur is a seasoned traveler to remote places of the world; she lived during the spring of 1930, on a house boat in a high valley of the Himalayas in India. She will relate her experiences and describe the quaint customs of the natives.

November 23—Filming Louisiana Wild Life Mr. Alfred M. Bailey

During the past two years the Academy has been compiling a film library, and Mr. Bailey will show some of the results obtained on the recent Academy expedition to the gulf coast. Louisiana is famed for its animal life, and the motion films portray many interesting species.

November 30—Life of Silurian Seas Dr. John R. Ball

The early life of the Chicago region, as revealed by the fossils in the rocks is an interesting one. Dr. Ball, Associate Professor of Geology and Paleontology at Northwestern University, will tell of the early inhabitants of Chicago, —creatures which lived between three and four hundred million years ago.

December 7—The Earth and Worlds Beyond Mr. Wallace F. Worthley

The discovery of the planet Pluto and the opening of the Adler Planetarium, both of them within recent months, have awakened in Chicagoans a new interest in astronomy which promises to be permanent.



THE SNOWY HERON

The snowy heron, or little egret, is once more a common bird of the southern marshes, but it was practically exterminated a few years ago when the beautiful, recurved plumes were in demand for the millinery trade. Now, thanks to wise legislation and careful protection, these white egrets have increased in number, and they nest by thousands in certain locations.

A few of the little egrets remain along the gulf coast throughout the winter, but the greater proportion of them migrate across the gulf to Central and South America. They return early in the spring, however, and start building their platform-like nests early in April in willows and button bushes; usually they will be found associating in the same colony with little blue and Louisiana herons.

There is a constant uproar in a heron colony, for the old birds seem very jealous of their rights. If a neighbor youngster wanders from its home and trespasses upon the domain of another, there are immediate, raucous protests and shrill shrieks as the youngster hastens awkwardly along, aided by the arrowlike thrusts of sharp beaks. Then the indignant owners of the invaded nest strut about the frail platforms with their shoulder plumes erected, as though well satisfied with their victories.

COLORADO

At the invitation of Mr. J. D. Figgins, Director of the Colorado Museum of Natural History, Mr. Bailey visited Colorado during August to survey the prospects for field work. Mr. Robert J. Neidrach, of the Colorado Museum staff, worked with Mr. Bailey, and they mapped out the possibilities for securing valuable life history records on motion film. It was too late in the season to make many pictures of the nesting birds, but a few hundred feet of film were secured. An especially interesting film was made of the nesting of the gray-headed junco.

Colorado should prove one of the most interesting places in the country to work, for the life zones run from the lower sonoran to the alpine, with a range of animal and plant life which would correspond with that found from southern Illinois to the coast of arctic Alaska. The Executive Committee of the Colorado Museum, through Director Figgins has extended an invitation to the Academy to carry on field work in Colorado this coming season. At Mr. Figgins' request, Mr. Bailey showed three reels of bird pictures from the film library, to the Executive Committee of the Museum, that they might see the possibilities in these films for educational work in the schools. In extending the invitation, Mr. Figgins commented on the films as follows:

"Since you are aware that Colorado is exceptionally rich in both subjects and opportunities for moving picture work of an educational character, you will appreciate my pleasure in being able to inform you that this museum's Board of Trustees have given their approval of joint activities between our institutions. Your wonderful success in this field will, I am sure, prompt a like course upon the part of the Academy officials. Your pictures have set a new standard in that they are not only unique in quality and have the highest value as an educational medium, but they are no less of scientific importance."

THE CHICAGO ENTOMOLOGICAL SOCIETY

The Chicago Entomological Society has recently become affiliated with The Chicago Academy of Sciences. Monthly meetings will be held in the lecture hall, and the collections of the Academy will be used as a basis for study.

The Society was founded on January 22, 1897 and has continued its activities to the present time. Among its members have been Professor S. W. Williston, Professor W. M. Wheeler, Dr. Martin Matter, Dr. Joseph Lane Hancock, W. L. Tower, C. C. Adams, Oliver S. Wescott, Arthur J. Snyder, John L. Healy and many others.

During the summer the meetings will be held outdoors, the members devoting themselves to collecting; the indoor meetings will be resumed in September or October.

The members are at present engaged in compiling a list of the Lepidoptera of the Chicago area, together with notes on food plants and life histories. It is expected that the records will be completed in the early fall and copy prepared for publication during the year 1930.

LOUISIANA FIELD TRIP



Snowy Egret and young

The animal life of Louisiana is an interesting one, and last May and June members of the staff carried on extensive field work along the coastal marshes. Mr. E. G. Wright and E. V. Komarek arrived at Avery Island the first week of May, and two weeks later they were joined by Mr. Francis R. Dickinson and Mr. Bailey. Through the courtesy and co-operation of Mr. E. A. McIlhenny, excellent motion films of the snowy egrets, Louisiana and little blue herons, and the anhingas were secured for the film library; and specimens of birds, mammals, and reptiles collected for the study series. An account of Avery Island, one of the most interest-

ing places in the south, has been given in the July issue of the Program of Activities.

After a week on Avery Island, it was necessary for Mr. Dickinson to return to Chicago, but the other members of the party remained in the field until the 10th of June. The Department of Conservation, through the Commissioner, Mr. Robert Maestri, and Mr. Armand Daspit, Director of Fur and Wild Life Division, gave every assistance possible to further the work, and placed their wardens and boats at the Academy's disposal. Mr. Segrera and Mr. Dyson, agents for the Department for the region near Avery Island, also co-operated fully, aiding in every way to make the work successful.

The Chenier au Tigre is an oak-grown ridge on the Gulf of Mexico, about thirty miles from Avery Island. It is an isolated region and is reached by boat from Abbeville. As there were no boats making a regular schedule, the trip was made with Mr. Dyson in the Conservation boat "Snipe." A visit to the Chenier is like going back half a century, for while the people are modern, their little community is so out of the way that old methods of agriculture and transportation still prevail. The ridge proper is about four miles in length, and anywhere from a few acres to a half mile in width. The common trees are majestic, moss-hung live-oaks, prickly ash, locust, ironwood, huckleberry, chinaberry, red haw, and mesquite, the latter forming an impenetrable tangle along beaches. Sandy shores extend along the gulf, while the endless marshes stretch to the north.

An interesting specimen collected on the Chenier was a derby flycatcher, a large form which inhabits the country along the Rio Grande; it was the first record from Louisiana.

MAY AND JUNE, 1930

Excellent motion films were made of several species of birds and small mammals, and a start was made on filming the life history of the alligator. These reptiles were numerous in the marshes, and Mr. Segrera, the host of the party on the Chenier, was well versed in their ways and gave a great deal of his time in helping to make the work a success.

After a week on the Chenier, work was next carried on on Marsh Island, a low island of great extent. Marsh Island has been set aside as a bird reservation, and is especially noted for the number of blue geese which occur there in winter. Photographs were secured of an alligator nest and eggs, and of the old female found in her den near by. Notes were made on the birds observed, and on the chief fur bearer of the region, the muskrat. These animals are very abundant, and two were picked up in Vermillion Bay more than five miles off shore, one dead and one alive.



Royal Tern and young

From Marsh Island, the party returned to Avery Island, shipped films and specimens back to Chicago, and then drove to Orange, Texas, just across the Louisiana border. Arrangements were made there with Mr. H. J. Lutchter Stark, Captain William Lea, and Mr. George Raborn for facilities for carrying on the work in Cameron Parish, the most southwestern county in Louisiana. This is an area of marsh land, for the most part, and one of the greatest wintering grounds of our wild fowl. Mr. Stark placed a speed boat and driver at the disposal of the party, and turned over his men and camp in order that every opportunity be given to make the work a success. Unusually fine photographs were secured of many of the marsh birds, and especially, of the wonderful American egret and the purple gallinule.

Mr. Stark and Mr. Raborn spent several days at the camp helping in the work; one evening they took Mr. Wright and Mr. Bailey to the roost of the American egrets. Hundreds of these immaculate-winged, plume birds were resting upon the tules, and as the headlights played upon them, they would rise, circle a bit, and then alight. Alligators are exceedingly abundant in Cameron Parish, and a large one was captured while the scene was recorded for the film library.

Two days were spent in New Orleans while preparations were made for the trip to the bird islands, and Mr. Bailey secured films of some of the common reptiles, through the kindness of Mr. Percy Viosca. The

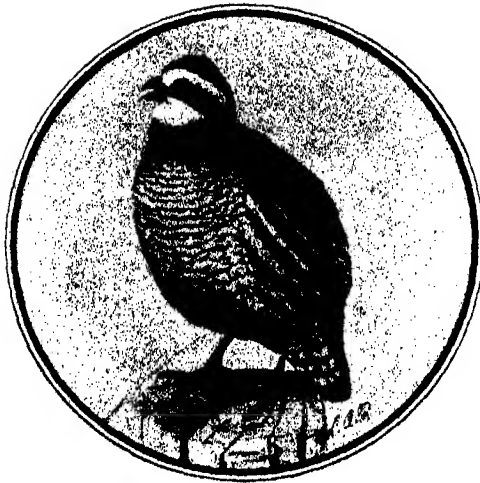
facilities of the Louisiana State Museum were extended to the party by Mr. Robert Glenk, the Director, and specimens and films were shipped to Chicago.

On the morning of June 7, the party, accompanied by Mr. E. S. Hopkins, left New Orleans on the Conservation boat "Royal Tern," Captain Haydel in command, to inspect the wonderful bird islands of the Louisiana gulf coast, and to make life history records in motion films. The great colonies of brown pelicans at the mouth of the Mississippi River were studied and photographed, and then the "Royal Tern" was headed northward over the shallow waters of the gulf. Breton Island, Grand Gosier, Tern, Brush, and North Islands were visited in the order named, and every opportunity was given to photograph and study the great colonies of terns, gulls, and skimmers. One colony of royal and Cabot terns, which was photographed, contained approximately five thousand eggs. From a distance, the flock looked like a snow field, and as we approached across the level expanse of wind blown sand, the birds raised from their nesting place and flew to meet us. A great flock of man o' war birds drifted over head and a few brown pelicans circled near, apparently out of curiosity. The photographic blind was erected and motion pictures were made of the thousands of nesting birds. Skimmers, Forster and least terns, and laughing gulls were studied on other islands.

This group of islands, extending northward from the mouth of the Mississippi River, was set aside as a national bird reservation by President Roosevelt, and the birds are guarded by the wardens of the Louisiana Department of Conservation. The men in charge of the patrol boats, are veterans in the service, and they not only know the waters they navigate, but they have learned to know the many species of birds, and where to find their colonies.

The Louisiana field trip was a success in every way. Many specimens were collected for the study series, many notes of the animal life were made which will be published in the near future, and two miles of motion film negative were added to the film library. The trip was made possible through the generosity of the Chicago Daily News and Mr. Francis R. Dickinson, who shared the expenses.

At a meeting of the Board of Trustees held on August 14, the members extended a vote of thanks to Mr. E. A. McIlhenny, Captain William Lea, Mr. H. J. Lutchter Stark, and Mr. George Raborn; to Mr. Robert Maestri and Mr. Armand Daspit of the Department of Conservation, and to Dr. Robert Glenk and Mr. Percy Vlosca for the many courtesies extended the representatives of the Academy on the recent field trip to Louisiana. A vote of appreciation was also given Mr. Walter Strong and Mr. James L. Houghteling of the Chicago Daily News, and to Mr. Francis R. Dickinson for their financial help which made the trip possible.



NOTES FROM
The Illinois Audubon Society

THE HERON INVASION

There have been many records of the American egrets and little blue herons from the Chicago area and nearby vicinity during the past summer. It has been a most unusual invasion, for while it is true that both species have been recorded in years past, they could only be classed as stragglers. During the past season, possibly because of the drouth in the Mississippi Valley, these herons have ranged northward in numbers, and they have been recorded from many localities. Mr. James White writes as follows regarding the herons:

"On August 10, with Mr. William I. Lyon, I visited a small colony near Libertyville where we found fourteen little blue herons. We spent considerable time making photographs and general observations. This was my first experience with this species, and I found that the birds could be approached within a distance of about fifty yards. However, they did not seem to hesitate to fly directly over one's head. About the middle of the afternoon, three birds were sailing around with outstretched wings, letting the air currents lift them higher and higher into the air until they were approximately two hundred yards up. All of a sudden, one by one, they would tumble toward the earth with a series of flip flops and side flips, straightening out when only a few yards from the ground. They would then proceed to repeat the performance. This was new to me and I was very much impressed with their maneuvers.

"I again visited this spot on August 17, but found only four birds. However, several miles away, near Gurnee, I found about eighteen of them on a small lake. I revisited this lake on August 24 and found twenty birds. This makes a total of thirty-four individuals located in Lake County.

"On September 1st I located twelve individuals on a lake near McHenry, and again visited this lake on September 7, finding only eight. This brought my total of birds seen within a month up to forty-six, and my counts were based on the number of birds actually in sight at one time. There was probably no duplication of count between localities.

"I have also observed a total of eight American egrets. The first was seen with the little blue herons near Libertyville on August 10, and seven birds were found near McHenry on September 7. Of these eight, I was able to observe only four separate individuals at close range, and found that none of them had plumes."

AMERICAN EGRETS AND LITTLE BLUE HERONS IN THE DUNES

On Thursday afternoon, August 21, we drove with Dr. Alfred Lewy in quest of the white shore birds he had seen the previous Sunday, August 17, and which he was strongly inclined to believe were egrets.

The first stop was at a marsh concealed from the highway by low dunes shortly before reaching the suburbs of Gary. Here we saw a white bird which was much larger than the little green heron nearby. We were quite close, and before it flew we saw plainly the pale yellow iris, yellow before the eye, and the yellow beak of the American egret. These head markings give the bird a peculiar expression.

From here we went just north of the high bridge over Long Lake leading to Lake Michigan. This is about half way between Miller and Dune Park.

Just as we arrived a passing train startled a flock of 23 into flight, some of them returning later. These were smaller and were the white phase of the little blue heron. They fed in the more marshy part of the lake with three little green herons.

In the more open waters stood quietly four of the larger American egrets, their slender bodies and graceful necks reflected in the water. Here again were two great blue herons which afforded satisfactory opportunity for comparing size and form.

Some of these birds were still in Long Lake on Sunday, August 31.

Dr. Amos W. Butler writes that he has received reports of these birds from the counties of Newton, Allen, and St. Joseph, of northern Indiana.

Lucy Baxter Coffin

FLUCTUATIONS IN THE NUMERICAL STATUS OF BIRDS

Observing birds from an automobile during a cross-country trip is a difficult and largely unsatisfactory procedure, especially when the observer is also the driver. Yet even under such conditions one can make certain observations that have some merit. This holds good with species that normally are found along roadsides as much as away from them and are easily identifiable.

The writer this past summer made an automobile trip of seven weeks through fifteen states east of Illinois, covering nearly 5000 miles. Much of this was through some of our choicest agricultural territory, much through terrain, woodland, and cultivated land.

Of such roadside-loving species as the red-headed woodpecker, the bluebird, the mourning dove, and the shrike, he saw only four to six, or at the highest, ten of each. Not so long ago it would have been three to four hundred. Purple martin colonies were seen only in scattered localities. Other swallows were far from plentiful. Our ornamental and largely beneficial hawks had almost entirely disappeared from the landscape. What a pity! We did not hear the call of a single whippoorwill, although we camped in a number of likely places. Neither did we see so many dead birds on the highway, killed by autos, as formerly. Have they all been killed off or are they learning to avoid the auto juggernaut?

The longer one observes nature the more profoundly impressed he must become with the fact that the fauna of a region, even its flora, is nothing fixed or permanent, but is rather in a constant flux. Species of animals or plants appear on the scene, reach their climax in number, and decrease or even disappear. The species named above seem to the writer to be decidedly on the decrease. Others could be added to the list, as e. g. the chickadee and the white-breasted nuthatch. Still others evidently are on the increase, such as the goldfinch, flicker, song sparrow, and perhaps the brown thrasher. Yet other species seem to be shifting their center of abundance, and even their migration routes. Of late, the western meadow-lark in ever increasing numbers is spreading its breeding range to within the vicinity of Chicago, replacing the lark sparrow, which has entirely disappeared. Even Brewer's blackbird is moving from northwestern Wisconsin into the Chicago region as a nesting species, following its congener, the starling—decidedly a change for the worse. The overgrown ring-necked pheasant is crowding out the bobwhite and the quail.

What is the significance and the true cause of these fluctuations? That to me, seems a worthy field for observation and cogitation. Of course, in the last named cases the solution is easy: Man's bungling interference with nature. If we could only finally learn to omit that! How much better is it to have our native birds multiply and flourish under protection than to have these foreign ones usurp their places?

C. W. G. Eirig

ARE THE PURPLE MARTINS WEATHER PROPHETS?

Sometimes our purple martins are here with us until the 28th of August or even into September, but usually at least until the 20th or 25th of August. What explanation can you offer for their early departure for their winter home this year? One colony in Hinsdale, according to a first page article in the Chicago Tribune, left July 29th. The majority of our group were gone early in August. And they were not just off for the regular evening gatherings on the north shore or in Jackson Park, which precede their migration, as I first supposed, for they did not return to cheer us up the next morning. How lonesome the garden seems when they are first gone!

Only two or three were still around until about the 12th of August. Were these the same scouts as in spring, making sure all was well before they left? All the martins of which I have heard left early. Did yours also? Does it mean an early fall? What do you think? Perhaps they thought it safest to get out of this neighborhood before the National Air Meet!

Catharine A. Mitchell

BIRD LECTURES

Mr. W. I. Lyon, chairman of the lecture committee, is arranging for several open meetings of the Illinois Audubon Society. The first one of the season will be held on October 30, at 8:00 P. M., in the Academy lecture hall, when the members of the Society will meet with the other members of the Academy. Mr. A. M. Bailey will show the motion films made during the past summer and will speak on "Filming Louisiana Wild Life."

ANNUAL BULLETIN

The past season has been an interesting one in many ways, and a number of unusual records have been reported from numerous stations. Copy is needed for the forthcoming Annual Bulletin. Members in all parts of the state are urged to send their notes to the Secretary that the Bulletin may cover as wide a range as possible.

MEMBERSHIP

If the Illinois Audubon Society is to grow and have a state wide influence in matters of bird protection and conservation in all lines of nature study, it is important that as large a membership be obtained as possible. Members are urged to ask their friends to become affiliated with the Society and take part in its activities.

Program of Activities

of

The Chicago Academy of Sciences

Vol. 2.

January 1931

No. 1.



30570

VIRGINIA OPOSSUM

Didelphis virginiana

The Virginia opossum is the only member of the marsupials or pouch-ed mammals found in North America. The young of the opossum number from six to twelve and are born in a very immature state. They are placed in the ventrally situated pouch by the mother where they are nourished for six to eight weeks, after which time they emerge. Opossums are common in the south but range northward through the Mississippi valley, and occur in limited numbers in the Chicago Area.

The Chicago Academy of Sciences

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ACADEMY ACTIVITIES

The fall meeting of the Academy was held on October 30, in the Academy lecture hall. At the business meeting previous to the program three life members, three contributing, one teacher, and sixty sustaining members were elected to membership, as listed on the page devoted to new members. It is encouraging at this time to have such a showing of interest in the Academy and its activities, and to have the additional financial support which is so necessary if the program planned by the officers is to be carried out.

Mr. Bailey showed four reels of motion films under the title, "Filming Louisiana Wild Life," and told of the Academy field trip to Louisiana during the past season.

Another series of pictures of wintering wild fowl and colony nesting birds on the off-shore islands will be shown in the spring. Members who were unable to attend the October meeting, will be welcome at the showing given for young people, Saturday morning, March 28.

MAMMAL SURVEY OF THE CHICAGO REGION

Robert Kennicott, the first Director of The Chicago Academy of Sciences, made a comprehensive study of the mammals of Cook County, Illinois in 1855. Since then, except for the present Academy survey, no intensive work has been done on the mammals of the Chicago area; however, a few collectors have taken specimens from time to time, so that valuable data have been added to the knowledge of our mammals. In 1929 E. V. Komarek and D. A. Spencer began a survey of the area within fifty miles of the loop, that definite information concerning the abundance of mammal life might be obtained, and notes secured on their life histories. During the work, sixty-four nights and one hundred and eight days were spent camping out in all kinds of weather, from twenty below to one hundred above zero. In this survey over three thousand mammals, largely rodents, were collected and studied, of which some four hundred and seventy-five were made into scientific study skins and are now in the collection of the Academy. Thirty-five localities were used as collecting sites, many of which were visited a number of times, both winter and summer. Besides these collecting stations, numerous other places were visited where only an odd specimen was taken or the mammals were studied and photographed. Burrows and nests of most of the rodents were examined. On the very margin of the Chicago area a new subspecies of pocket gopher, which has been named the Illinois pocket gopher (*Geomys bursarius illinoiensis*, Komarek and Spencer), was taken. Specimens of the pocket gopher were also taken in Indiana, which appear to be the first records from that state. In all, thirty-nine species of mammals were found to be living in this region at the present time, while fifty-three are known to have existed in this area within historic times. The complete results of this field work will be published in the near future. The following is a list of mammals to be found in this area at the present time, so far as the results of the survey show:

Virginia Opossum
Southern Flying Squirrel
Western Fox Squirrel
Northern Gray Squirrel
Gray Striped Chipmunk
Thirteen-lined Spermophile
Franklin's Spermophile
Woodchuck
House Mouse
Norway Rat
Northern White-footed Mouse
Prairie White-footed Mouse
Meadow Mouse

Prairie Meadow Mouse
Pine or Mole Mouse
Muskrat
Lemming Mouse
Illinois Pocket Gopher
Jumping Mouse
Mearn's Cottontail Rabbit
Red Fox
Coyote
Illinois Skunk
American Badger
Mink
New York Weasel

Alleghenian Least Weasel
Bonaparte's Weasel
Common Shrew
Hoy's Shrew
Short-tailed Shrew
Prairie Mole
Little Brown Bat
Trousart's Bat
Silver-haired Bat
Brown Bat
Hoary Bat
Red Bat
Rafinesque Bat



MASSASAUGA

Sistrurus catenatus catenatus

The Massasauga is the only rattlesnake now to be found in the Chicago region, a few being taken each year in the Indiana Dunes and, occasionally, one near Deerfield. This pigmy rattler is usually found in swampy areas in the northern states, and is rapidly being exterminated in its range where the land is being developed for agricultural purposes. It resembles, in its habits, the copperhead and water moccasin, feeding largely upon frogs, while the larger rattlesnakes partake of warm-blooded prey. The Massasauga is a stout-bodied reptile, rarely found larger than three and a half feet. The little fellow pictured above was one of a family of nine born to a small female captured in September of this year with another adult female, near Mineral Springs, in the Indiana Dunes. The second adult also gave birth to nine young in captivity. Ditmars says: "The bite of an adult, if properly delivered—both fangs thoroughly perforating the flesh—might easily produce the death of a man."

In the United States there are to be found nineteen species of poisonous snakes of six genera. They are: two species of moccasins, the copperhead and the cottonmouth moccasin; two pigmy rattlesnakes, the massasauga and the pigmy rattlesnake; eleven true rattlesnakes; two coral snakes; and two opisthoglyph snakes whose bites are not ordinarily considered fatal.

KENNICOTT CLUB

On April 28, 1930 a group of local naturalists met in the laboratories of the Academy and organized the Kennicott Club, naming the organization in honor of one of the first zoologists of this area, Robert Kennicott. He was the first director and one of the founders of the Academy. The purpose of the club is to fill a great need among our local workers in natural history; that is, an informal gathering place where they may meet and discuss natural history subjects from a scientific view.

The Kennicott Club meets at the Academy the first Tuesday of every month and is limited to twenty-five members who are active in zoological work in and around Chicago. The present officers are:

President Ruthven Deane
Vice-President James White
Secretary-Treasurer E. V. Komarek

The members are:

A. M. Bailey	B. T. Gault	Wilfred H. Osgood
Pierce Brodkorb	C. P. Grant	Karl Plath
H. B. Conover	S. S. Gregory Jr.	Colin C. Sanborn
Ruthven Deane	Tappan Gregory	Karl P. Schmidt
A. J. Franzen	C. J. Hunt	Walter Weber
C. W. G. Eifrig	E. V. Komarek	James White
E. R. Ford	Frank Lett	Earl G. Wright
	W. I. Lyon	

THE STATE MICROSCOPICAL SOCIETY OF ILLINOIS

At the last meeting of the Board of Trustees and Scientific Governors the State Microscopical Society of Illinois was affiliated as a Section of The Chicago Academy of Sciences. The Society is a very old one in Illinois, having been organized in 1869 for the purpose of

1. Aiding those who use the microscope, especially in industrial work and scientific investigation.
2. Increasing public interest in the microscope and in its revelations.
3. Offering opportunities to members of the Society to demonstrate and publish their discoveries and methods of work.

This is accomplished by regular monthly meetings, field days, public soirees, lectures, special meetings of members in groups and sections, and by the publication of the bulletin.

The Academy has now affiliated with it as sections such old and tried societies as the above, the Entomological Society, and the Illinois Audubon Society. It seems fitting that the Academy should become the meeting place of scientists and those interested in the popularizing of science of the region.

WINTER PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during the winter of 1931 at the Assembly Hall, Sundays at **3:00 P. M.**

January 25— The Earth and Neighboring Worlds Dr. Clyde Fisher

Dr. Fisher of the American Museum of Natural History returns this year to talk about the solar family. He will tell about the discovery, and what is now known, of the new planet Pluto.

Illustrated with Slides

February 1— The Utah Fairyland of Bryce Canyon Dr. C. O. Schneider

Dr. Schneider has shown his lovely natural color pictures of the west several times to Academy audiences. This time scenic canyons of Utah will be the subject.

Illustrated with Autochromes

February 8— Abyssinian Trails

Alfred M. Bailey

Few travellers have visited far off Abyssinia; it is a country of contrasts. Mr. Bailey will tell of his experiences as a member of the Field Museum—Chicago Daily News Abyssinian Expedition.

Illustrated with Slides

February 15— Primitive Tribes of Angola, Portugese West Africa

Wilfred D. Hambly

Mr. Hambly, Assistant Curator of African Ethnology of the Field Museum of Natural History will describe his experiences as leader of the Rawson—Field Museum Expedition to West Africa.

Illustrated with Slides

February 22— Adventures in the Mahogany Forests of Nigeria

Captain Richard St. B. Baker

Captain Baker of England is a well-known traveller and explorer who founded the organization known as "The Men of the Trees," a group which has done much for the conservation of tropical wilds.

Illustrated with Slides

March 1— The Wonderland of Mexico

Captain James C. Sawders

Captain Sawders is a correspondent who has been an eye witness to the stirring events of the past few years in Mexico and Nicaragua.

Illustrated with Slides

SATURDAY TALKS FOR BOYS AND GIRLS AT 10:00 A. M.

February 21—Backyard Adventures with Animals Wallace F. Worthley

Animal pictures are not difficult to secure if one is on the alert for good subjects. One's own pets offer many opportunities for delightful studies of animal life. You will enjoy Mr. Worthley's pictures of dogs, cats, toads, snakes, and other animals taken in and about the city.

February 28—Adventures with a Camera in Abyssinia Alfred M. Bailey

Mr. Bailey has traveled and hunted in many parts of the world, but some of his most interesting adventures occurred in Abyssinia. You will want to see his pictures and hear him tell of his experiences there.

March 7— Fifty Pounds of Flour and a Hundred Pounds of Beans

Wallace W. Kirkland

Mr. Kirkland has canoed, trapped, hunted, and photographed for years in the North Woods. He will tell of his experiences in driving a dog sled in the dead of winter in the north, and show motion films of the animal life found there.

March 14—"Bugs"

Wallace F. Worthley

To many people, insects are dirty, disgusting, and even dangerous creatures. To others, however, their lives are most interesting. Mr. Worthley will describe, with slides and motion pictures, some of the fascinating things about these lowly creepers and crawlers of the insect world.

March 21—A Taxidermist at Work

Earl G. Wright

For those of us who can not travel to distant parts of the world to see wild animals in their native homes, much of the book of nature would be closed if it were not for the museum. Mr. Wright will tell how animal specimens are prepared and mounted in their natural settings in the museum groups.

March 28— Filming Louisiana Wild Life

Alfred M. Bailey

Mr. Bailey conducted a photographing and collecting trip into Louisiana this past summer. Among the animals seen, which he will bring to you by way of motion picture films, were herons, egrets, snakebirds, frogs, snakes, and alligators.

NEW MEMBERS

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Julius Rosenwald

Teacher Members

Charles A. Donnel

Contributing Members

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V. R. Lynch

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Herman Waldeck



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

BACK-YARD NOTES

Even though a suburban community may have abundant shade trees, both along streets and surrounding houses, proximity to a wooded stream brings to bird lovers many bird intimacies that are denied to folks living inland.

The city of Berwyn is approximately one mile east of the Des Plaines River, and although many streets are lined with beautiful trees and in the rear of many homes are ideal thickets and dense trees, rarely do we have unusual birds nesting with us. Robins and grackles are common, as they have been for a number of years, robins being unusually abundant in the summer of 1930.

The only other birds that persistently nest in our immediate neighborhood are the Baltimore orioles and the catbirds.

Contrary to the writer's experience, the Baltimore orioles have nested each year in a giant cottonwood tree, which, during the summer has foliage so dense that it is impossible to locate the nest until after the leaves have fallen. The usual nesting sites selected by orioles have been in trees bearing slender twigs that swayed in the least breeze. Terminal branches, even the smaller ones, of the cottonwood, are ordinarily quite rigid and more or less brittle. The nest has invariably been built inside the tree, and not on an outside terminal twig as is usual when placed in an elm.

The arrival of the oriole in spring time is always announced by the singing of the male, who makes the rounds of the neighborhood, letting

us know that he has come home. More than most birds, the male oriole whistles throughout the summer, and the notes of our oriole are so little varied that we always recognize them as belonging to our summer resident.

Another interesting married couple in our neighborhood, is a pair of catbirds. West of our garage is a dense wall of privet and Persian lilacs; south of the concrete drive is a thick wall of syringa. For three seasons this pair of catbirds has nested within a radius of fifty feet, and each season, has raised two broods. The birds are very tame and one hears very little of the excited mewling, characteristic of the birds when alarmed or annoyed. Whether the same pair has returned each year is of course not definitely known, but from their actions it is more than likely. The singing of the male bird has been a delight, and he was not at all stingy with his performances.

In May and June, at times we heard from the shrubbery where the catbirds usually resided, remarkably clear, whistled notes quite unlike even the catbird's mimicry. These notes were unlike any of the familiar whistled notes of other birds, which the catbird so aptly imitates. Careful watching, however, discovered the performer to be the catbird, and many of the neighbors asked the identity of the strange bird that whistled so beautifully.

During each summer the red-eyed vireo while wandering about, visits our neighborhood, and two years ago, the summer of 1928, in the great cottonwood where the orioles nest, a pair of warbling vireos favored us by locating and raising at least one brood. Like the red-eyed vireo, the warbling vireo is a persistent singer, and throughout the summer, its sweet notes could be heard at morning, noon, and eventide.

During the spring and fall migrations many warblers, thrushes, and other birds make longer or shorter calls on us. They do not, however, win from us quite as much affection as do those that nest with us.

Orpheus M. Schantz

A SWAMP REVISITED

In these days of swamp reclamation one goes with fear and trembling to find a haunt that one has not visited for over twelve years. What will remain of the ten-acre spot, or will it be, perchance, a corn field? I visioned the nest of the blue-winged teal daintily covered with down in a tussock of grass, and remembered the tree swallows almost touching our heads as they sported in the air about us. A large group of students once met a king rail stepping out for a walk from one swamp to another. My boys on one occasion located a gallinule's nest in water six inches deep, not far from shore. It meant wet shoes or going barefooted to see it, so I chose the latter. Once in early spring a yellow-headed blackbird visited the redwings.

Would the orchestra be as lively as formerly? The barking of the coots, the indescribable calls of the king rail, the whinny of the sora, the grunt of the Virginia rail, the scolding notes and song of the long-

billed marsh wren, the delightful notes of the redwings, the alarm note of the killdeer, the thunder pumper, the squawks of the little green and the black-crowned night herons—all these were still here.

At the Madison Avenue swamp southwest of Hinsdale I found bird life even more abundant than ever. A half dozen king rails fed along the shore, little disturbed by our presence. In a small cove a least bittern and two sora rails fed contentedly. Little green herons skulked in and out along the margin. A great blue and a black-crowned night heron sailed in at sunset. The spotted sandpipers and the yellow-legs added their notes to the chorus. A flock of ducks flew overhead. What a paradise for the swamp bird life! We have too few of them left in our area.

Esther A. Craigmile

BREWER'S BLACKBIRD IN THE CHICAGO REGION

About June 10 I was informed that there was a small colony of Brewer's blackbirds nesting in a field near Winnetka, and that this field was being dragged in order to tear out the weeds, which would in all probability break up the colony. I visited this locality early on the morning of June 15 and found about eight pairs of these birds. Whether or not all of them were nesting I do not know; I saw one pair which was hanging around a nest that had been destroyed in dragging that portion of the field. The destroyed nest was built on the ground near the base of some thick weeds, and was constructed of weed stems and lined with dried grass.

This was my first experience with Brewer's blackbirds, and I can now easily see how these birds can readily be mistaken for the red-winged blackbird by the casual observer. In flying I could make no distinction between the male birds and the male redwing, inasmuch as the size is about the same and the note the same. Of course, seeing both male and female against a good background, one may immediately notice the difference in the two birds.

I was informed shortly after I made this visit, that, through the dragging of the field this colony of birds was driven out, and as far as I know, were not again located.

James S. White

LECTURES

The officers of the society have felt that January and February are poor months to have public lectures, and so the next one will probably be in March. The announcement will be in the Annual Bulletin which is now being prepared. It will be appreciated if members will suggest speakers they should like to hear.

"OUR GREAT OUTDOORS"

Members of the Illinois Audubon Society and The Chicago Academy of Sciences will be interested to know that Dr. C. W. G. Eifrig has recently published the second in his series of nature books. Under the general title of "Our Great Outdoors" the series will eventually cover the whole vertebrate phylum of the animal kingdom. The first volume on mammals was published in 1928 while the second, on reptiles, amphibians, and fishes has just come from the press. They were prepared, to quote the author, "not to add another to the great number of books on nature and nature study with which the market is already flooded. They owe their origin, rather, to the desire expressed to the writer by teachers and teachers' conferences that he prepare a book of this kind to be used as a school text." The books are ideal for their purpose: they are well printed and nicely illustrated with drawings and photographs, and are simply and interestingly written. They are of value to teacher as well as student in that valuable suggestions are made for their use in classroom, and for the teaching of vertebrate life forms. Owing to Mr. Eifrig's years of experience as a teacher he has been able to present the subject in a way which can not help but interest the school child in the wonders of nature. The books are remarkably cheap in price for their quality, and are from the press of Rand McNally & Co.

TRANSIENTS

"Here today and gone tomorrow" is an appropriate expression for the bird student. How often we record a species but once or twice in a year or period of years. What determines the abundance of a given species; why should birds be rare in one place and common in an apparently similar area near by? There is an explanation for many things, but when we really begin to question why, we find how little we really know about birds. The recent invasion of herons from the south was an interesting one, but why should they have been so abundant the past season and so rare in other years? We say an extremely dry season brought them north—but then, why should the flocks consist of young only—at least in the case of the little blue heron. If experience and habit has a great deal to do with the actions of birds will the herons which visited us this past season return in adult plumage next year? We doubt it, but we do not know.

And speaking of transients, what birds have you seen the past season? N. Bergendahl reports an American egret from along the Kankakee River, Will County, Illinois July 22, a double-crested cormorant from Porter County, Indiana, in November, and snow buntings near Balletown, Indiana, November 9.

Program of Activities

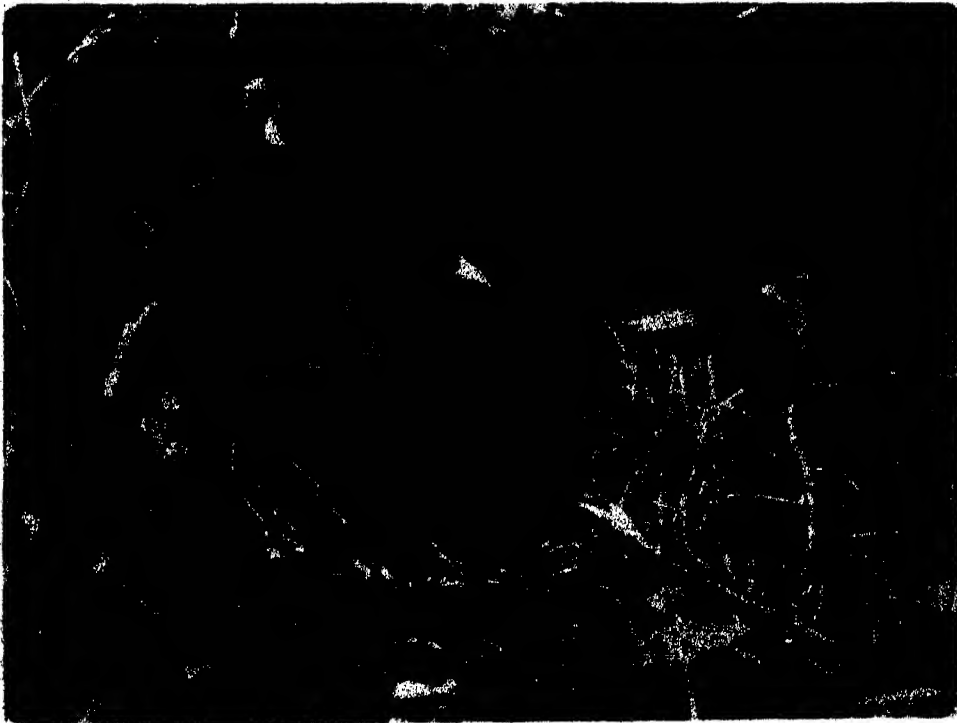
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No. 2



GRAY HEADED JUNCO

Junco caniceps

Resembling as it does other members of the genus Junco in possessing white outer tail feathers, the gray-headed junco is distinguished from them by its gray head and sides, and bright rufous back. It breeds in the Rocky Mountain region from the Black Hills to the Guadalupe Mountains in New Mexico and Texas. In the Chicago Region the slate-colored junco, so familiar in the early spring, is the only member of the genus to be classed as a migrant.

The Chicago Academy of Sciences

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BOTANY
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GEOLOGY

SPECIAL MEETING

A special meeting of the Academy was called on February 6 to advance the date of the annual meeting from the second Monday in May to the second Monday in April. The annual meeting will be held this year on April 13.

THE FILM LIBRARY

The collection of motion film negatives in the Academy vaults now includes many valuable life history records of birds and mammals. Additional storage space has been authorized by the officers of the Academy, so that they may be preserved in the best manner possible. All the negative is of standard size, and it is hoped that reduced prints may be made for use in public schools. There are many requests from teachers for such material for class room work, but until funds are available, it will be impossible to give the material the wide circulation it should have. A comparatively small amount of money each year would make it possible to show our films of North American animal and plant life to thousands of children. It is impossible for children of the large cities to become acquainted with the animals and plants of the countryside, but the out-of-doors can be taken to them through the use of motion films. An endowment is needed for the work, and anyone interested should consult the Executive Committee.

THE ANNUAL MEETING

The Annual Meeting of the Academy will be held on Monday evening, April 13 at 8 o'clock in the Academy lecture hall. The lecture of the evening will be given by Dr. Arthur Compton, professor of physics at the University of Chicago. His subject will be, "At Home with the Atom," and will be accompanied by experiments describing the methods the physicist has of getting acquainted with the atom. The lecture will be illustrated with lantern slides and motion pictures.

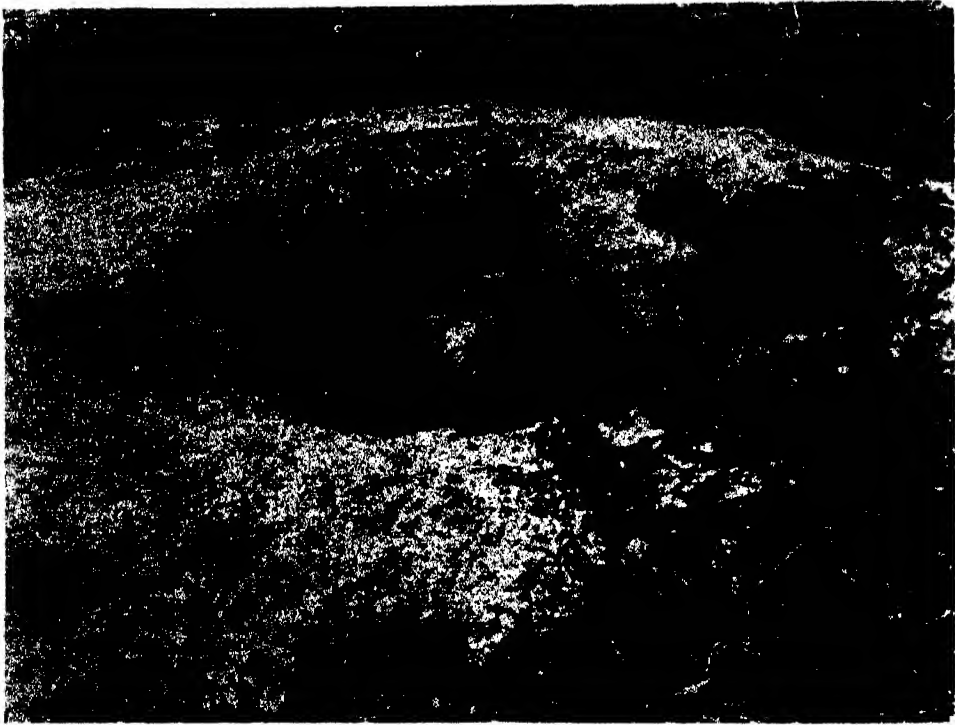
Dr. Compton is one of the most brilliant of our American physicists, and one of the three in that group who has received the Nobel prize in recognition of his epoch-making discoveries. He is the youngest American to have received that prize. "He has, however, been widely known among scientists for some years because of his brilliant research on atomic physics, and anyone who reads the literature of that science will find in it frequent mention of the so-called "Compton effect." This name was applied by other scientists to Professor Compton's most significant discovery, the change in wavelength of X-rays when they are scattered. The particular significance of this obscure phenomenon is that it constitutes the strongest existing piece of evidence in favor of the much-debated quantum theory of light. How Professor Compton discovered this effect is a triumph of deductive thought. From mathematical work alone he first predicted it, then he set out to determine whether actual fact agreed with theory. It did. Since then many other physicists have amply established the truth of his observation." *Scientific American*

BIRD EXCURSIONS BEGIN ON APRIL 1

School children, members of the Academy, and their friends, are again to have an opportunity to participate in the daily bird walks in Lincoln Park to observe the spring migrants as they arrive in Chicago on their northward journey. As in former years, the walks will begin at 7 A. M. and will last for an hour or an hour and a half, during which time instructions will be given in the identification of the birds seen. As most of the birds known to visit the Chicago Area may be seen in the museum habitat exhibits, and in the new systematic collection recently installed, it is comparatively easy for one to become acquainted with the birds of the region, and the methods of identification in the field. The Children's Science Library contains many books about birds, an extensive picture collection, and several hundred stereopticon slides in color.

The Academy's Bird Excursion Card, giving the average date of arrival of most of the land birds observed in Lincoln Park during the spring migration, will be sent to those interested.

In order that the groups taking these walks may get the most out of them, the size of the party will be limited to twenty. *Appointments must be made in advance* by calling the museum, Diversey 5871. Mr. Wallace F. Worthley will again conduct the trips.



PRAIRIE DOG

Cynomys ludovicianus

The prairie-dog is one of the commonest rodents of the western plains, ranging from the Canadian border to the Gulf, and from the mountains eastward, nearly to the Mississippi River. Its peculiar "bark" has been responsible for its most popular name, but it is also known as barking squirrel, burrowing squirrel, and prairie squirrel. It is a heavy bodied, woodchuck-like, little squirrel about fourteen inches in length, reddish-brown grizzled with grayish above and yellowish white below.

It is a most gregarious and sociable little animal, thousands living in close association and harmony with each other. Vernon Bailey tells of a great prairie-dog town covering several thousand square miles, with a population of some 400,000,000 individuals. The mounds which form the entrance to their homes are several feet in diameter, and cleared of all vegetation. These burrows are nearly vertical for a distance of from ten to fifteen feet, and then turn at right angles for a like distance. As the burrows may be used for many years, several nesting tunnels a few feet in length may be dug off the main horizontal passage. The unused nests may be partly filled with rubbish. The depth of the tunnel seems to have no relation to water supply even in quite arid regions; the prairie-dog seems to be able to live without drinking.

LOAN COLLECTION OF MOTION FILM

The first 16 mm. prints to be made available to schools were received thru the courtesy of the Canadian government. The films include a wide range of subjects, but all pertain to the out-of-doors. There are twelve subjects, at present, as listed below, which will be mailed to any school in the city, free of charge:

"Canoe Trails thru Mooseland"	Moose and deer in Canadian lakes and streams
"Muskellonge Fishing in Canada"	A party of fishermen and their catch
"Birds of Bonaventure"	Marine birds of lower St. Lawrence
"Rambles in Gaspesia"	Scenery and bird life of Gaspé Peninsula
"Nomads of the Sea"	Nesting gulls and other sea birds
"Monarchs of the Plain"	Bison and elk in a Canadian government reservation
"Harvesting the Deep"	The codfish industry
"From Catch to Can"	The sardine industry
"The Story of a Can of Salmon"	The salmon canning industry
"Land of Evangeline"	Scenery in Nova Scotia
"Harvesting Maple Sugar"	An industry of the Canadian woods
"Conquest of the Forest"	Lumber industry in Canada

Further information may be secured at the Academy office.

SCHOOL LECTURES

In addition to the lectures given on Saturday mornings at 10:00 A. M., the past six weeks, many illustrated talks have been given to the various grade and high schools by Mr. Wallace F. Worthley and Mr. Francis R. Dickinson. The lectures include the following topics:

- Tramping thru Glacier and Rocky Mountain National Parks
- Backyard Adventures with Animals
- Wild Flowers of the Chicago Region
- The Earth and Worlds Beyond
- Birds of the Chicago Region
- Alaska and the Yukon
- Louisiana Wild Life

Lectures were also given in the American Museum, Cornell University, Pennsylvania Athletic Club, and the Cleveland Museum of Natural History by Mr. Bailey, which were illustrated with subjects from the Film Library.

FIELD ACTIVITIES

Mr. E. V. Komarek, of the Academy staff, with three associates from the University of Chicago, Messrs. C. H. Seevers, R. E. Boke, and D. E. Lowrie, will leave on March 20 for six weeks field work in the Great Smoky Mountains of North Carolina and Tennessee. They will make a preliminary ecological survey of the vertebrates of that region, with emphasis on small mammals.

The Colorado Museum of Natural History has invited the cooperation of the Academy in the making of motion films depicting the faunal and floral life of Colorado, during May and June. Director J. D. Figgins and Mr. R. J. Niedrach of the Colorado Museum, both well acquainted with the territory to be covered, and Director A. M. Bailey, Messrs. E. G. Wright, F. R. Dickinson, and E. V. Komarek, of the Academy, will comprise the personnel of the expedition.

Mr. J. R. Snyder will collect small mammals and birds in Alberta, Canada, this summer, while Paul Minter will collect small mammals in Wisconsin. The specimens will be deposited in the Academy's study collection.

GEOLOGY AND GEOGRAPHY COURSES AT NORTHWESTERN

Two members of the Academy are extending their teaching services this year beyond their customary term of service. Dr. W. H. Haas, Vice-President of the Academy, and Dr. J. R. Ball, Honorary Curator of Invertebrate Paleontology, both of Northwestern University, are to teach in the Summer School of that institution. Dr. Haas will give courses in the Geography of North and South America. These are regular courses of the academic year, but will be repeated this summer. Dr. Ball is to give a course in the Regional Geography and Geology of the Chicago Region. The latter is fundamentally an outdoor course and combines one and one-half days of field work each week with the classroom discussions. The Chicago Area offers a field of surprising attractiveness for excursion studies, and the range of the trips will be from southeast Wisconsin to Starved Rock and La Salle. The Summer School at Northwestern begins June 24 and continues 8 weeks, until August 15.

REPAIRS AND IMPROVEMENTS

The Academy has occasion again to express its gratitude to the Lincoln Park Commissioners for their fine spirit of cooperation. Within the last few months an entirely new roof of concrete and tile has been placed on the building, replacing the old one which was not only in bad condition, but actually dangerous to visitors entering the front doors.

The Commissioners were instrumental, also, in replacing the worn stone steps at the entrance to the building with cement ones.

Now that the maze of boarding and scaffolding has been removed from the walls, the building may again be seen as it was in the early days of its existence, a little darker, to be sure — for Chicago's dirt is not kind to its architectural efforts, but now covered with a luxuriant growth of ivy which is always so pleasing, and so rarely found on public buildings in our region.

A much needed improvement in the lecture hall was the installation of a fire-proof projection booth. No longer does the whirr of the motion picture machine compete with the voice of the lecturer in our small hall. And the lecturer himself is not forced, as heretofore, to receive the divided attention of boys and girls, large and small, who are always interested in the mechanisms of the various projectors used in the talks.

THE AMERICAN ALLIGATOR

Alligator mississippiensis (Daudin)

The Spanish "El Lagarto," the lizard, has come to mean alligator to us. Belonging to the Reptilia, it is one of two species of Crocodylidae found in the United States, the other being the American crocodile, *Crocodylus acutus* Cuvier. It is, however, much better known than the latter, ranging from North Carolina southward, throughout Florida, and westward along the Gulf Coast to the Rio Grande in Texas. The crocodile, in the United States, is found only in Florida.

The broad, blunt snout, heavier body, and more massive skull serve to distinguish the alligator from the crocodile, whose long pointed head and exposed lower fourth tooth is so distinctive as to be unmistakable.

The thirty or forty eggs of the alligator, similar to hens' eggs, but more elongate, are laid in a large nest of decaying vegetation, which probably serves to incubate them, for a period of about two months. When hatched, the young are about eight inches long. Contrary to opinion, alligators grow comparatively rapidly, reaching a length of perhaps five feet in five years, when conditions are favorable for their growth. Even in captivity this growth has been observed, but only when sufficient food and high enough temperature of air and water have been provided for them. In their native habitat alligators have been known to reach a maximum length of sixteen feet. Due to the fact that they are so persistently hunted, and have been for more than fifty years, it is hard to get a twelve foot 'gator or even a ten footer now-a-days.

Alligator hides are being used extensively for purses, travelling bags, shoes, music rolls, brief cases, belts, and other articles where the unique and scaly appearance of the leather is more attractive than the smoother leather of commerce. The U. S. Fish Commission in 1895 estimated that fully 2,500,000 alligators were killed in Florida between 1880 and 1894.

No species of animal can long survive this relentless battle with man. These ordinarily harmless and inoffensive reptiles have tried to hide out in the more inaccessible swamps and rivers of the coastal region, but their extermination is certain. It will not be long before the naturalist and nature lover will be obliged to study the alligator, not in his natural environment, but in zoological parks and alligator farms where man-made conditions prevail.



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Teacher Members

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Contributing Members

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NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

RECOLLECTIONS OF BIRD LIFE IN CHICAGO 40 YEARS AGO

The sorrowful sense of the passing of the years is intensified for those who live from youth to age in the changing environment of a large city. So many and so swift are these mutations that few objects or scenes are left for visible reminders of their young days.

A map of Chicago of forty years ago is among my possessions. Then Irving Park Boulevard was Graceland Road; Montrose Avenue was Sulzer Street and Lawrence Avenue was Jefferson Road. Then Bowmanville, High Ridge, Verona, Grayland, Pennock, and Maplewood were the names of distinct communities instead of half-forgotten appellations vaguely indicating sections of a great metropolis.

As I look upon this map I see the names of places that once were the haunts of birds and I think of what the generations of men have done to them. In the places that I recall, where now are towering apartments and thronged streets, might then be seen many of the familiar species which, long since, have ceased to be our neighbors.

Just south of the Fullerton Avenue Station of the elevated railway, in the grounds of the McCormick Theological Seminary, the prairie horned lark once nested (1889). West of the "L" at Webster Avenue, a small colony of Bank Swallows had their burrows in the abandoned excavation for the foundation of a building (about 1888). In the vicinity of Sheffield and Garfield Avenues a small grove of oaks was the summer home of the wood pewee, yellow warbler, chipping sparrow, least flycatcher, and red-headed woodpecker.

In Lincoln Park the kingbird, Baltimore oriole, the warbling and the red-eyed vireo, chipping sparrow, and yellow warbler made their homes. Once, even, when the pit for the "North Pond" was being dug, a kingfisher had its nest there. And once, too, in the northern part of the park, near Diversey Boulevard, there was a pair of nesting orchard orioles.

Near the lake — south of the present Edgewater Beach Hotel — a marshy swale, just back of the shore, harbored the king rail and the long-billed marsh wren. Along the truck garden margins east of Broadway (then Evanston Avenue), the spotted sandpiper laid its eggs. Across the road the dickcissel, the black-billed cuckoo, and the goldfinch bred.

Just north of Graceland Cemetery, in a district later known as Sheridan Park, mourning doves, field sparrows, thrashers, and lark sparrows dwelt throughout the summer months. Once I found a lark sparrow's nest near the present site of the National League Baseball Park. Here, too, in a tract we knew as "Sheffield Woods," were crested flycatchers, catbirds, yellow-billed cuckoos, cedar birds, thrashers, and bluebirds.

There was a small colony of bobolinks in a field at Sheridan Road and Montrose, while song sparrows and phoebes were common along the open ditches bordering Lincoln Avenue, Ridge Avenue, Broadway, and such highways leading into the open country.

On the oak ridges along the lake (south of Rogers Park), and in the brushy swales between them, were yellow-breasted chats, indigo buntings, wood thrushes, hummingbirds, and the like. We commonly regard the cardinal as a recent comer to our region. Comparatively speaking, he is; but in the locality here noted - that which we knew as "Imhof's Woods," we found a nesting cardinal in 1891.

A great cottonwood stood in the field close by the edge of "Budlong's Woods" (Foster and Lincoln Avenues). Here a pair of red-tailed hawks had an eyrie which could be seen from the deeply rutted highway (1887).

I think it is not to be supposed that birds returning to their ancestral breeding grounds, and finding them so altered, are able to persist. Their generations are of few years (in the case of the smaller species probably less than three years on the average.) If birds returning the second year, or their progeny, find the cover gone and move outward, they must move into occupied territory - that is to say, territory capable of sustaining only a given number of pairs and broods of a given species, which, by reason of that capability, is already in use. Hence, either the tenants or the invaders must succumb. In a few years the generations which once lived in this grove or that field (the one being cut down and the other built up to human uses) will have perished utterly.

The increase of human populations must always mean the decrease of bird and other animal populations, except where certain species are adaptable and except where humans can be brought to make special provisions for others.

E. R. Ford

17 YEARS OF BIRD BANDING IN THE GREAT LAKES REGION

W. I. Lyon has compiled a list comprising a total of 35,329 birds banded by him since he began the work in 1913 up to December 31, 1930. One hundred sixty-one species are represented. His record shows 7461 white-throated sparrows; 6741 herring gulls; 3475 slate-colored juncos; 3094 common terns; 1857 Caspian terns; 1471 ring-billed gulls, and 1088 fox sparrows.

Other species of which more than 500 have been banded are: bronzed grackle, 845; tree sparrow, 504; song sparrow, 606; brown creeper, 637; robin, 993.

Species banded in numbers from 100 to 500 are: sanderling, 116; spotted sandpiper, 100; yellow-billed sapsucker, 136; blue jay, 347; cowbird, 371; red-winged blackbird, 228; white-crowned sparrow, 479; Lincoln's sparrow, 247; swamp sparrow, 218; cedar waxwing, 202; black and white warbler, 256; myrtle warbler, 106; ovenbird, 248; northern water thrush, 141; catbird, 264; brown thrasher, 283; gray-cheeked thrush, 207; olive-backed thrush, 154; hermit thrush, 311.

Twenty-four species are represented by a single capture.

Besides all this, 5532 English sparrows were taken and destroyed. This was the fate too, of 201 cats. Of other mammals including dogs, rats, weasels, and opossums, 616 were taken.

The estimated number of repeats is 86,200. The returns were 900.

THE PAST SEASON IN THE CHICAGO AREA

Our calendar tells us that we are very near the end of our winter season. However, up to the present time, we have had no winter, and about as much can be said of the species of birds generally classed as winter visitants. Correspondents on every hand report practically no bird life, comparatively speaking, in the Chicago area during the past few months.

There have been only a few old squaws, mergansers, golden-eyes, and scaup. About the same can be said of other winter visitants, such as juncos, tree sparrows, snow buntings, longspurs, hairy and downy woodpeckers, nuthatches, chickadees, etc., except that juncos and tree sparrows have come and gone with rather irregular movements.

The presence of various hawks and owls has been the only thing bordering on the interesting that we have had reported to us since December. Mr. Cleveland Grant reports that at least thirteen snowy owls have been brought into various taxidermist shops within the past couple of months. We have observed three goshawks, and have many reports of sparrow, red-tailed, and rough-legged hawks, and barred and great horned owls in this vicinity for some weeks past.

Some few of our summer residents outguessed the weather man and seem to have spent the winter here, as I have reports of robins and have observed red-headed woodpeckers wintering here.

Indications seem to point to a very early spring migration, and in some cases it may have already begun, as Mr. Gault has had reports of a meadowlark

singing near Glenn Ellyn as early as February 4, and Miss Craigmile reports that meadowlarks and song sparrows were singing in River Forest on February 10, which is extremely early for both species. Mrs. Richardson also reports the return to the dunes of the juncos and a few robins on February eighth, also a very early date for robins. The biggest surprise of what might be the advance guard of this early spring migration was experienced when we observed a perfectly healthy killdeer on the Waukegan Flats on February 22.

All in all, the past nine months have been very disappointing as well as surprising to us from the standpoint of bird life in this area, and we are looking forward with interest to the coming season.

James S. White

NOTES FROM RIVER FOREST

A barred owl was pursued by a flock of crows in Thatcher's Woods, River Forest, on the morning of December 21. The owl perched on a chimney where he was quickly struck by a crow. He lost his balance and fell inside the chimney. The proverbial small boy saw the encounter and communicated the news to his father. Sure enough, the father heard the owl struggling above the fireplace. Mr. Harris put on a pair of strong gloves to afford protection from the owl's huge talons, and extricated it from the chimney.

It was placed in a screen cage where they could examine the small round head and the huge black eyes that were almost hypnotic. Ernest Badenoch kept it a few days, feeding it red meat. It escaped from the basement cage where it was confined, and enjoyed larger quarters. It even gave a concert one evening which was far more blood curdling than the detective story Ernest was reading. After a few days, the prisoner was released.

I have identified the saw-whet, screech, long-eared, short-eared, and great horned owls in this locality. This is the first report I have had of the barred owl.

February 17, I watched a flock of fifteen starlings feeding north of Trinity High School in north River Forest. They were wary, flying from the ground when I was half a block away. February 20, I saw at least two hundred starlings in the same locality for two hours. They perched on the telephone wires like martins and then left in small flocks to feed on the ground. The day was cloudy. This was the largest flock of starlings I have seen in the region. February 21, I revisited the spot, finding not a single starling. They must have commuted for better feeding grounds, the day being such a mild, sunny one.

In an hour's walk in the woods along the river February 21, I identified tree sparrows, juncos, cardinals, hairy and downy woodpeckers, chickadees, crows, a white-breasted nuthatch, and an owl (probably great horned—being pestered by crows; it flew before I could identify it).

Esther A. Craigmile

Program of Activities

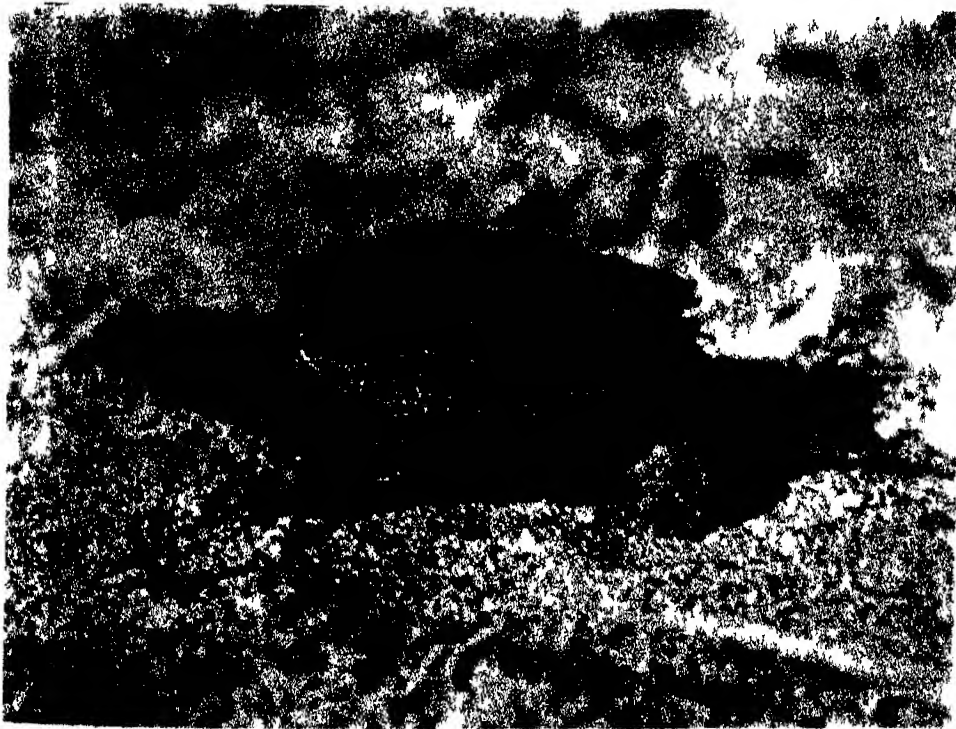
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The Chicago Academy of Sciences

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No 3



THE COMMON SNAPPING TURTLE

Chelidra serpentina (Linne)

The snapping turtle is found in ponds marshes and sluggish pools of wood land streams it is one of the most common and well known reptiles of the Chicago Region "Snappers are armed with strong sharp-edged jaws they strike with vicious rapidity and they have the tenacious grip of a bulldog — as many a small boy has learned to his sorrow Their range extends over eastern North America from southern Canada to the Gulf of Mexico and west to the Rocky Mountains Where conditions are favorable they often attain a weight of over thirty pounds

The Chicago Academy of Sciences

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THE ANNUAL MEETING

The Annual Meeting of the Academy was held on Monday evening, April 13. Dr. Arthur Compton, professor of physics at the University of Chicago, delivered the lecture of the evening, "At Home with the Atom," illustrated with lantern slides and films.

The results of the election of officers was made known early in the meeting:

Dr. Henry C. Cowles	President
Dr. W. H. Haas	Vice-President
Dr. Edmund Andrews	Second Vice-President
Dr. N. S. Davis III	Secretary
Mr. Fairbank Carpenter	Trustee
Dr. Fay-Cooper Cole	Scientific Governor
Mr. Clarence L. Holtzman	Scientific Governor

The Secretary reported in part that "since the last Annual Meeting many new members have been added including: twenty-six Life, seventeen Contributing, two hundred and twenty-three Sustaining, seven Teacher, and six hundred Associate members.

FIELD ACTIVITIES

Extensive field investigation has been carried on by members of the Academy and the staff during the past spring. Mr. F. R. Dickinson and Mr. Bailey made a short trip to the southern coastal marshes, through the co-operation of Mr. Robert Maestri, Commissioner of the Louisiana Department of Conservation. One of the boats of the Department was placed at their disposal, and they visited two important bird sanctuaries, — one on Marsh Island, and the other, the Paul Rainey Wild Life Refuge. Motion films of the various species of birds were made, the most valuable being the series of the blue goose. This interesting species occurs in flocks of thousands and, through the valuable help of Mr. Sugrera, who lives at Chenier au Tigre, the Academy now possesses an unusual film record. Photographs were secured of a flock of blue geese upon the ground — the birds were standing so close together that only white heads showed — and the flock was one hundred yards wide and more than four hundred yards in length.

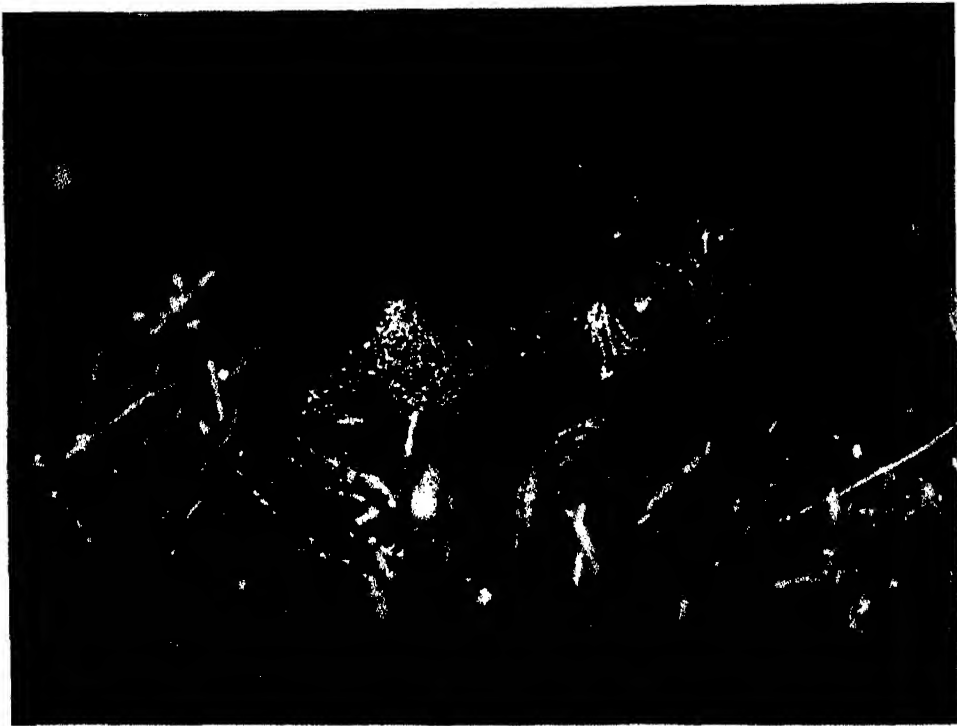
Mr. H. Boardman Conover, a member of the Academy, Mr. Bailey, and Mr. W. F. Ardis flew from Brownsville, Texas to Durango, Mexico, in the Mexican plateau, and as guests of Mr. W. E. Brock, of Durango, several days were spent investigating the animal and plant life.

As one of the necessities of wild life conservation of this country is to have a treaty with the Mexican Government for the protection of migratory birds, the members of the party interviewed local people and conducted field investigation to determine what efforts were being made in bird protection.

The region about Durango is an interesting one, with extensive timber belts on the near foothills where deer and turkey are found, while the lake region to the northward is one of the most important wintering grounds of wild fowl in all Mexico. An hour's trip by air to the westward, over the Sierra Madre Mountains — or six days by pack mule — is the town of Mazatlan, at the mouth of the Gulf of California. Two days were spent making photographs in this tropical region.

J. R. Snyder has left for Alberta, Canada, where he will collect specimens of birds and mammals on the Buffalo Head Ranch which is located in the foothills of the Highwood River Valley. This region is directly south of Banff National Park, between Porcupine Hills and the towering peaks of the Canadian Rockies, and, as it is an excellent region for wild game, it should prove an interesting locality for study. Mr. Snyder will have the co-operation of Mr. George Pocatena, owner of the ranch.

Extensive photographic work was carried on in Colorado in May and June, through the co-operation of Mr. J. D. Figgins, Director of the Colorado Museum of Natural History, and Mr. R. J. Niedrach, of the staff of that museum. Mr. F. R. Dickinson and Mr. Bailey worked with the above mentioned naturalists in securing motion film of the animal and plant life, while Messrs. Wright and Komarek made collections of birds and small mammals for the study collections of the Academy. Details of the Colorado trip will be given in the next number of the Program of Activities.



THE COMMON BULLFROG

Rana catesbeiana Shaw

This deep bass singer of the ponds and marshes in the Chicago region is not so widely distributed as most of the other members of its family, being found only at the western, northern, and southeastern limits of the area. Wherever it is found, however, one is not long in doubt as to its presence in the late spring, as its resonant bass voice may be heard a mile or more from its swampy home. "Jug-c-rum," or perhaps more frequently, "brr-wum," it seems to say. This sound is made by the passage of air over the vocal cords in the throat. Another sound, almost a scream in its intensity, is sometimes heard when the frog is in great distress, when captured by one of its natural enemies or man. By rowing quietly towards the spot from where its voice appears to be coming, and using one's flashlight carefully, it may be seen partly submerged among the waterplants, its large, protruding eyes staring unblinkingly into your light. Even at a distance it is possible to tell the male from the female. The latter is darker and more heavily spotted, while the former is more uniformly yellow-green. The male's ear, that large, circular area just back of the eye, is much larger than that of the female's which is about the size of the eye.

Upon being frightened the bullfrog will dive, holding his forelegs close to his sides and striking out with the powerful strokes his hind legs are capable of

producing. While drawing up these legs in preparation for the power stroke, the large web between the toes is collapsed, but when pushed outward the web fills with water, offering such resistance that the frog moves forward with great speed. While swimming, his eyes are withdrawn in their sockets to protect them from harm. The bullfrog under water breathes only through his skin. It is this adaptation which makes it possible for life to exist during the long months of hibernation.

The bullfrog tadpole does not mature until the second, and sometimes the third year, and when fully developed may reach a size, including legs, of 18 inches. His large size and capacious mouth make the bullfrog the terror of his community. Insects, fish, frogs, turtles, and small birds unlucky enough to get within his reach are eagerly devoured. Even baby ducks swimming about in their marshy home are not safe from the big fellows.

They are not without their own enemies, however. Snakes, turtles, hawks, owls, and herons take their toll of young and adult, and man himself is their chief foe. Hundreds of thousands are sold annually in the markets of the United States for food, and their great demand threatens the extinction of this most interesting amphibian.

DR. BALL TO GO ABROAD

Dr. J. R. Ball, Honorary Curator of Invertebrate Paleontology, is on sabbatical leave for the year 1931-32 at Northwestern University. He contemplates a rather extensive trip abroad for study and recreational purposes. It is his intention to study especially the paleontological exhibits of foreign museums, as well as to engage in field work in Europe and elsewhere. He leaves about September 1st, will spend considerable time in England, and then work as far north into the Scandinavian Peninsula as practicable before cold weather sets in. Then he will work southward through Europe as far as the Mediterranean for the winter months. The Orient he expects to visit and explore until spring or early summer; the remainder of his time will be spent in the western United States. Dr. Ball expects to secure considerable museum material for Northwestern University during his trip, and will of course, collect at the same time for the Academy's museum.

Mrs. Ball will accompany him for the entire journey, and his daughter, who is now in France, may accompany her parents for the latter part of the trip.

BEN GAULT BIRD SANCTUARY IN GLEN ELLYN

The Glen Eilyn park board has recently purchased a tract of land in the town, approximately 100 feet in frontage, running from Main Street to Forest Avenue. The park board has decided to call the sanctuary the Ben Gault Bird Sanctuary in honor of Mr. Gault who has taken such an interest in this project, and who is an international authority on bird life. It is planned to surround the property on all sides with a high animal-proof wire fence, and perhaps later erect an observation tower within it where the birds may be watched and studied without frightening them. Native trees and wild flowers will be added from time to time to make the sanctuary a natural and hospitable place for migratory, as well as nesting birds.

NOTES FROM COLORADO

The field work which is being conducted in Colorado, as we go to press, proving a success. Mr. Bailey writes as follows: "We have been making motion film in the northeastern part of the state, in Weld County. A precipitous escarpment runs from Wyoming across a corner of Colorado and Nebraska, and we have found the nests of many birds of prey along these cliffs. The prairie falcon, ferruginous rough-legged and Swainson's hawks and the golden eagle nest commonly; three nests of the eagles were found in a distance of five miles. We were extremely fortunate in finding nests which were favorably situated for photography, for the cliffs are so precipitous that only a small percentage of them can be examined. The breeding season of these large birds is rather an extensive one, the eagles being the first to have their young. Their eggs are hatched during the latter part of April, while the rough-legs' and falcons' young were not hatched on June 1. We found a falcon's nest containing five eggs in an excellent place for our purpose, and so obtained pictures without great difficulty. The female was an exceptional bird in that she was cream-colored. Mr. Niedrach has known this old one for more than nine years, and each season she has nested within a few hundred yards of the present site. We have found the rough-legs the most difficult to photograph, for they are exceedingly shy, and desert their nests when a blind is erected. Good nesting photographs were secured, however, after several trials. Our most interesting hours were spent with the golden eagle, and films were made of the adults swooping onto the nest with prairie dogs and rabbits in their talons; the young were over half grown fellows, and while they were waiting patiently for the old ones to return, they would while away the hours by jumping up and down and flapping their wings."

PEPOON'S FLORA OF THE CHICAGO REGION

During the year 1927 the Academy published Pepon's "Annotated Flora of the Chicago Region," a book which had been looked forward to by professional botanist and amateur alike, for many years. This book may still be obtained from the office of the Academy. The book fills a long-felt want in that it concerns itself only with those flowers, shrubs, and trees which are found within a radius of fifty miles of Chicago, thus eliminating from consideration more distant species which might lead to confusion.

Six distinct floral regions are discerned by the author, and each is treated in a separate chapter of the 136-page descriptive text. In the catalog which follows, consisting of more than 400 pages, over 1900 native plants are listed, to the majority of which are given one or more common English names. The book is beautifully illustrated with 7 full-page maps and 115 excellent photographs taken within the area. Twenty-five simple botanical keys make possible the ready identification of most of the plants listed.

The Flora of the Chicago Region, by Herman S. Pepon, Price \$3.50

VACATION HOBBIES

Summer is the time when the boy and girl naturalists become most interested in their favorite hobbies. It is then that they have enough leisure to collect the things they are most interested in, to draw or paint or take pictures or to become better acquainted with the birds, and trees and flowers about them. Below are listed a few of the many interesting things that boys and girls may do during their vacation, things which will help to make this summer more enjoyable and useful than any they have ever had.

1. Keep a record of the birds you have identified. Draw or paint their pictures. Use your camera.
2. Make a collection of pressed flowers, tree leaves, grasses, or ferns.
3. Make blue-prints of flowers, leaves and ferns.
4. Collect and identify rocks, stones and minerals.
5. Make a collection of shells.
6. Collect and mount moths, butterflies, and other insects.
7. Keep an aquarium or terrarium and fill it with insects, fish, amphibians, and other life from ponds about you.
8. Keep and care for a pet of some kind.
9. Collect caterpillars, watch them spin their cocoons; take them to school in the fall.
10. Learn to know the stars and planets. Make a chart of the constellations.
11. Make a map of your summer home or camp; the grounds, trees, trails, etc.
12. Make a garden and keep a record of its growth.
13. Get a Boy Scout Handbook, and see if you can pass the tests for Tenderfoot, 2nd class, and 1st class badges.
14. Collect fossil specimens.
15. Make a seed collection.
16. Keep a diary and scrap book. Put down the questions you would like to have answered when you go back to school in September. Illustrate them with your own drawings and photographs.
17. Keep your camera busy. Shooting birds and other animals with a camera is the best test of scout and sportsman.

EDUCATIONAL ACTIVITIES

The Bird Excursions conducted in Lincoln Park during the months of April and May were very successful. Mr. Worthley reports 681 young and adult ornithologists were present on these walks, and about 100 spring migrants were seen in all. In so far as is known, the Academy is the only museum in the country which schedules daily bird walks for such a long period in the spring. Such favorable comment was received from the daily newspapers that a much greater attendance is expected next year.

Many schools availed themselves of the lecture service which the Academy maintains. Over 8000 students were reached in this way during the spring alone. Talks were given on birds, mammals, insects, and astronomy to 27 schools in the city.

GREAT SMOKY MOUNTAINS FIELD TRIP

A preliminary survey of the vertebrates of the Great Smoky Mountains of Tennessee and North Carolina was made by E. V. Komarek and Walter L. Necker of the Academy staff, and R. L. Boke, D. C. Lowrie, and C. H. Seevers, of the University of Chicago, from March 20 to April 25. The region zoologically, is practically unknown,— especially the Tennessee section in which the work was carried on.

The party stopped at Mammoth Cave, Kentucky on the way, and made a collection of interesting cave fauna including white blind crayfish, white spiders, and cave crickets. The headquarters of the party was at Greenbrier, Sevier County, a beautiful upland area within the Smoky Mountain Region, from which the members were able to work on Mt. Le Conte, Brushy Point, Horseshoe Ridge, and along the divide between Tennessee and North Carolina. Bear and deer were reported fairly common in parts of the mountain range, although none was seen in the section worked.

More than 300 small mammals were collected, among them such interesting forms having northern affinities, as the red-backed, cloudland, and lemming mice, and the red squirrel; others were typically southeastern forms, such as the rice rat, golden mouse, and white-footed deer mouse. Marmots, chipmunks, cotton-tails, pine mice, and flying squirrels, which are found over eastern United States, were also taken. In all, 18 species and subspecies were collected in the Smokies.

The bird life was also very interesting. Mr. Komarek was fortunate to witness part of the courtship performance of the wild turkey; the drumming of the ruffed grouse and the screaming call of the pileated woodpecker were heard very commonly, as both species were abundant. Many birds were observed, including such northern forms as the winter wren, Carolina junco, golden-crowned kinglet, olive-sided flycatcher, and red crossbill.

A large collection of about 1100 specimens of reptiles and amphibians was made. Salamanders were exceedingly abundant, and Messrs. Komarek and Necker collected over 200 specimens in 20 feet of one little mountain stream. Altogether about 20 species of reptiles and amphibians were secured in the area.

The area worked is one of the most scenic in the Alleghany region, with hills covered by dense vegetation, which rise from an altitude of 1400 feet to more than 5000 feet. Additional field work will be undertaken at another season.

CALIFORNIA FIELD TRIP

Mr. R. L. Boke, a field-assistant of the Academy, has been collecting mammals during May and June in the Santa Lucia Mountains of California, and will remain in the field until the latter part of September. He is making a special study of the parasites of mammals. At present he is working on the Hearst Ranch at the southern end of the mountains. Later in the season he will collect farther north near Carmel. He writes that mammals are very abundant, and that he is getting many parasites from them.



NOTES FROM

The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

THE GOLDEN EAGLE AND THE PHEASANTS

On the wintry afternoon of March 6, 1931 a large bird appeared, flying low over a snow stretched plain of northeastern Colorado. Many hawks had been seen during the winter, and at first thought this big bird appeared to be one of them. Our field glasses immediately revealed him to be a great eagle. He was a younger member of the family of the golden eagle of the west, whose coloring was still that of the younger generation, dark brown and black, with white tail feathers. The gold of head and neck, according to Apgar, appears in older birds.

We watched with keen interest to see what brought this great bird of the sky down to a fence post on a ranch beside the Lincoln Highway. Soon the object of his search was spied. Among some dry and scattered weeds along the banks of an irrigation canal was a group of seven ring-necked pheasants. How beautiful in coloring, how exquisite in delicate grace these pheasants appeared, in comparison with the great dark bird of prey above them! Pheasants are considered large birds, but these looked tiny as they stood motionless with terror beneath the eagle eye of the king of the air.

A clearing sky, after a blizzard of twenty-four hours duration, brought the hungry eagle down to earth to find, what is considered by man, a peculiarly delicate morsel of flesh, the pheasant. The laws of Colorado protect the pheasant, but the law of the air, like "the law of the jungle," knows no such restraint.

The eagle glared down upon the lovely pheasants, then lifted his wings, whose stretch was probably more than four feet, and rose into the air. Sweeping 'round and 'round above them, his ugly talons seemed to reach down to seize a victim. Did they fly? Not one of them. Instinct forbade. The swift eagle could soon overtake the slow flight of the pheasant. He lighted on the ground, from

which we expected to see him rise with a poor bird dangling from his talons. Not so! The frightened, but wise pheasants had slipped beneath the wires of the fence to the other side and stood waiting. The eagle tried to follow, but found that he was not familiar with barbed wire entanglements, and that his delicious meal must be gained from another approach.

Again and again he rose high in the air, circling above the pheasants. Each time, as he was about to touch the ground, they glided swiftly to the other side of the fence. The eagle stalked to and fro. The bird of majesty and grace high in the air, was a clumsy, awkward object on the ground. In one downward glide, he was so determined to win his point by alighting on both sides of the fence, that he swooped down upon the fence, was caught, and hung struggling and helpless.

Up to this time interference might have meant death to the pheasants. What was to be done now? Could we watch the great golden eagle die an ignominious death on a barbed wire fence? Could we extricate a fierce and hungry creature, whose attack might mean a dangerous encounter? Should we produce the musket which Daniel Tilton carried in the war of 1812 (proven good for service by the shooting of a rabbit during the winter) and end the life of a bird whose race is all too fast becoming extinct?

Attention was so centered on the eagle that we almost forgot the pheasants. This was their opportunity. Three of them seized it and flew to parts of greater security.

Before we could decide what to do, the eagle had freed himself, and was pursuing the same tactics as before. The four remaining birds still continued their skilful mode of defense. For an hour we watched the absorbing procedure,

The eagle's flight became less frequent. He rested on a fence post and eyed the pheasants. Finally, the great golden eagle winged his way beyond our sight, outwitted by the ring-necked pheasant.

Eliza H. Stamm

ILLINOIS CONSERVATION—A PROTEST

This is the story of conservation in Illinois state parks. At the close of the legislative session in 1929 the state appropriated funds for the purchase of land north of Savanna, which is now known as the Palisades State Park. It was turned over to the Department of Public Works for improvement. Of the several parcels of land aggregating between three and four hundred acres only one tract of eighty acres was of interest to the conservationist and botanist. This area had never been farmed, grazed, or quarried as the rest had been. More important still, no effort had ever been made to eradicate the rattlesnakes and, consequently, its reputation had, to a certain extent, protected it from the public.

This tract is three miles north of the city of Savanna. A deep ravine, locally known as "Fern Hollow," cut by a small stream flowing into the Mississippi, was until 1905, covered by primeval oak timber. Rattlesnakes infested the sunny parts of the north side which slopes south, and held for their den an outcropping of limestone. Everybody knew that these snakes claimed a space of several acres and trespassed at their own risk. The harm done by the snakes was negligible and over a period of forty years or more there was only one recorded bite, that being received by a small spitz dog, which survived the attack. Snakes were killed there every year by venturesome small boys and others. These snakes were never known to go over to the cool, shaded north slope of the south side of the ravine.

In the woods of the south side grew the choicest of wild flowers: pink and yellow lady's slipper, *Trillium recurvatum*, *Trillium grandiflorum*, dutchmen's breeches, bloodroot, hepatica, adder's tongue, showy orchis, masses of walking and maiden hair ferns, etc.

Following 1905 the third owner of the ravine began a systematic policy of turning trees into railroad ties and, of course, the whole place has since been reduced to a mere shadow of its one time beauty and the flowers have suffered severely from the changed conditions. However, this little secluded nook is still outstanding as the best there is over a radius of many miles. A tributary brook with shallow ravine joins the larger stream just across from the rattlesnakes' den and it was in this particular retreat that one could follow the song of the hooded warbler, "You must come to the woods or you won't see me," and find its nest. Those familiar with this bird's choice of nesting site can easily imagine the tangled mass of ferns, flowers, and underbrush which covered the cool shady glen. It was here one could find the Kentucky warbler, and this was the only place where the mourning warbler was recorded in migration.

It was this dell which went into the hands of the Department of Public Works to be cleaned up for park purposes. One of the first things to be done was the digging out of a three foot trail over the beds of fern, bloodroot, dutchmen's breeches, and hepatica on the north slope to reach a lookout! Next came the eradication of the rattlesnakes! Quoting the Savanna Times-Journal as follows: "Improvements will be made during the spring and summer months at the Mississippi Palisades State Park, according to William Ehredt, custodian, under the direction of H. H. Cleaveland, of Springfield. The 2000 rods of wire fencing was completed yesterday. The purpose of the fence is to pasture goats and sheep to kill off the weeds and underbrush. Two new walking trails will be made, but the location of these has not been definitely decided. Roadways will be made and gravelled next week. Of course, it will take some time before all improvements have been completed, but when they are finished, this will be one of the prettiest parks in this part of the country."

The fence thus described encloses about two thirds of "Fern Hollow," including both shady and sunny sides of the ravine. The trilliums, showy orchis, hooded warblers, and rattlesnakes are all over behind it. Pigs, goats, and sheep were all considered, but the decision fell to the latter and two hundred of these relentless grazers have been turned in. They have their choice of maiden-hair ferns or rattlesnakes as food, and not being carnivorous animals, it is not hard to see which they will destroy.

Protests have been sent to H. H. Cleaveland from various conservation groups including the Conservation Council, the Illinois Audubon Society, and The Chicago Academy of Sciences, and replies such as this have been received:

"The park property has been fenced for pasturing the sheep for the purpose of keeping down the growth of weeds, grass, shrubs, etc., in an attempt to rid the park of rattlesnakes which are quite numerous at the park. We feel that the presence of the rattlesnakes in the park is very dangerous to visitors from the cities who visit the park in great numbers, and that the Department should make every possible effort to rid the park of these snakes."

The matter of conservation in Illinois State Parks seems well-nigh hopeless.

Nellie J. Baroody

JOURNEY TO THE GREAT SMOKY MOUNTAINS NATIONAL PARK

During the last week of April 1927, a party from Chicago took advantage of the spring vacation period to meet the spring in the Smoky Mountains. In this party were a number of botany students under the guidance of Dr. George D. Fuller of the University of Chicago. Beginning with that excursion, going to the Smokies to meet the spring has become an annual event which is not only a delightful and restful outing, but nearly always results in the finding of something not before seen by members of the party, and frequently the accidental discovery of plants that are rare finds for even experienced botanists. On April 25 the writer with a party left Chicago for the south, and when we arrived at Gatlinburg we were greeted by Dr. H. S. Pepon who had gone ahead of us. The following week was one of perfect weather so that each day was a delight from early morning until evening. Not anywhere else in North America is there a greater variety of plants, birds, and insects.

The transition from Chicago to Knoxville, a distance of 600 miles, is from a first awakening to a wide open spring. From the base level at Gatlinburg of 1291.8 feet, one may in 45 minutes travel by auto over a fine state highway to the crest of the divide between North Carolina and Tennessee 5100 feet above sea level, the highest mountain road-crossing in the eastern United States, on the way through the primeval forest passing through zones of vegetation where leaves were fully developed, and dogwood, silverbell, redbud, magnolia, and azaleas were at their best and on the forest floor trilliums, phlox, and a bewildering variety of violets and other early spring flowers. Above 4000 feet the deciduous trees were mostly left behind, being largely replaced by huge hemlocks and, with only the yellow birch, a few buckeyes, and at intervals against the dark evergreen background, white torches of the shad tree, which in the mountains grows to a height of 40 to 50 feet, and a trunk diameter of 12 to 18 inches. At the top of the divide, spring beauties, toothworts, and yellow adder's-tongue were just coming into bloom, and tree and shrub leaves were still tightly folded. Here one might stand with one foot in Tennessee and one in North Carolina, looking south into the hazy Nantahala range, and north across the great chasm through which the highway had been cut, to LeConte mountain, 6593 feet, the highest peak entirely within Tennessee, and the most impressive mountain in the new New National Park. Here is the home of the pileated woodpecker, raven, Carolina junco, winter wren, blue-gray gnatcatcher, yellow-breasted chat, many rare warblers, summer tanager, and many other birds that find in the cool forests of the Smokies, Canadian zone conditions that the Mississippi valley migrants must go much farther north to find. The Smokies abound in many small mammals, rare moths and butterflies. One is constantly bewildered by the great size of the forest trees, and climbing vines. When, however, the age of the Smokies and the great annual rainfall—73 to 100 inches—is taken into account the growth is easily understood.

That such a region should not be better known seems incredible; but isolation and lack of highways is the answer. During our visit title to more than 92,000 acres of the finest spruce forests along the higher mountain crests was adjusted, and the area now acquired amounts to over 300,000 acres, with about 150,000 acres more to be included. This will make the new national park the first great park east of the Mississippi River; also one of the largest in the United States. Within a radius of less than 700 miles reside 80 per cent of the population of the United States, and access is possible from all directions by railway and fine highways.

Orpheus M. Schantz

Program of Activities

of

The Chicago Academy of Sciences

Vol. 2.

October, 1931

No. 4.



Photograph by A. M. Bailey and R. J. Niedrach

THE GOLDEN EAGLE

Aquila chrysaetus canadensis

The rolling western prairies, the wooded foothills, and the barren, wind-swept mountain tops are all in the range of this noble bird of prey. There is no sight more wonderful than a pair of eagles sailing over jagged peaks, dark against a cloud-filled sky. They nest on high, precipitous ledges where they have a commanding view of the surrounding country — and their young are free from molestation.

The Chicago Academy of Sciences

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AUTUMN MEETING

The Haunts of the Golden Eagle

The fall meeting of the members of the Academy will be held Tuesday, November 17, in the Academy lecture hall, at 8:00 P. M., and Mr. A. M. Bailey will show motion films made on the recent Colorado field trip, under the above title. This is the first showing of these western films, which were made for the Academy's film library, and they include life history photographs of many forms of animal and plant life of the mountain states. All the photographs were made within the range of that regal bird of prey, the golden eagle, for its habitat is from the low country to the alpine prairies of the mountain summits. A brief resumé of the work accomplished is given in this bulletin.

This meeting will take the place of the October gathering for the members of the Illinois Audubon Society and the Chicago Ornithological Society.

AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during the fall of 1931 in the Assembly Hall, Sundays at 3:00 P. M. The doors will be closed at three o'clock, or before, if the hall is filled.

October 18—Einstein's Theory of Relativity

Dr. Clyde Fisher

It is appropriate to have Dr. Fisher open the Academy's lecture series, for he has appeared on the program on many occasions, and is a friend of long standing. His last two lectures at the Academy have been on "John Burroughs" and "Astronomy."

Illustrated with Motion Pictures

October 25—Social Insects

Prof. Alfred Emerson

Modern naturalists have gained a great deal of their knowledge by field research in other lands. Dr. Emerson started his career with a field trip to British Guiana with William Beebe, and it was there that he first became interested in the study of the life histories of social insects.

Illustrated with Slides

November 1—Mount Rainier

Mrs. Laurie Frazeur

Mrs. Frazeur is a world traveller who has visited remote portions of the globe. She lectured at the Academy last season on "The Vale of the Kashmir."

Illustrated with Slides

November 8—Mexico

Mr. F. P. Clatworthy

Mr. Clatworthy is recognized as one of the foremost color photographers in the world. His present lecture deals with the wonderful country south of the Rio Grande, where he spent many months securing material. Many of his photographs have appeared in the leading magazines of the country.

Illustrated with Autochromes

November 15—Tar Traps of Rancho La Brea, California

Dr. Chester Stock

There is no subject more fascinating than that of the animals which once roamed across our own country. Elephants, saber-tooth tigers, and giant ground sloths were once citizens of our far west, and Dr. Stock will tell their story as revealed by the pits at Rancho La Brea.

Illustrated with Slides

November 22—Plants and their Cultivation in Ancient and Modern Egypt

Dr. George K. K. Link

Dr. Link has recently returned from Africa where he studied the plants of Egypt, and the modern methods of cultivation as contrasted with those of the past.

Illustrated with Slides

November 29—With Scott in Antarctica

Dr. Griffith Taylor

Before becoming Professor of Geography at the University of Chicago, Dr. Taylor lived many years in Australia and became the recognized authority on the geography of that continent.

Illustrated with Slides



Photograph by A. M. Bailey and R. J. Niedrach

PRAIRIE FALCON

Falco mexicanus

The range of the prairie falcon is over the western part of the United States; it is a bird of the open spaces, and is found most commonly where steep cliffs rise from the prairie. The nests are usually placed on inaccessible ledges, where the four to six brownish mottled eggs are incubated in comparative safety, for there are few people with sufficient curiosity to interfere with them. Both male and female falcons incubate. They are swift of flight, and dart through the clouds with the speed of an arrow; they are able to take their feathered victims while on the wing, and seize small mammals as the little creatures are scurrying for cover. While it is true that the prairie falcon occasionally kills other birds, the greatest part of its food consists of mice, ground squirrels, and prairie dogs, and so, it is a beneficial species worthy of protection. The above photograph was made in Weld County, Colorado, this past season. The nest was in a depression on the face of a precipitous cliff, but there was a break in the wall which allowed the photographers room for their photographic blind.

FIELD ACTIVITIES FOR 1931

A brief outline of the field operations of the Academy for the past season may be of interest to the members. The collections of birds, mammals, reptiles, insects, and plants have been increasing rapidly through gifts and field trips, and the comparative material available to students is becoming more valuable with each season.

Louisiana

During March, Mr. F. R. Dickinson and A. M. Bailey worked the coastal marshes of the gulf coast of Louisiana, through the cooperation of Mr. Robert Maestri, Commissioner of the Louisiana Department of Conservation, and obtained over a thousand feet of motion film of various species of animals and plants. One of the most interesting of all the water fowl is the blue goose, for while the majority of our ducks and geese have decreased in numbers to such an extent that conservationists are seriously alarmed, this fine bird has held its own, due, undoubtedly, to the protection it receives on its wintering ground in Louisiana, and to the fact that it breeds in isolated regions of the north.

The majority of the birds of this species are found in winter, gathered in flocks of many thousands of individuals on the broad savannahs bordering the gulf, and owing to the nature of the marshes and the wildness of the birds, it is difficult to approach within photographic distance. After many attempts, the photographers crawled within fifty feet of the feeding thousands and a unique record was made.

Mexico

During the latter part of March, Mr. Bailey joined Mr. H. B. Conover, a member of the Academy, and Mr. W. F. Ardis, at Brownsville, Texas, and they flew to Durango, Mexico, on the Mexican plateau, where they were the guests of Mr. W. E. Brock for two weeks. Mr. Brock had a pack train in readiness, and the members of the party travelled southwest along the Rio San Juan, through some of the most picturesque country in the interior of Mexico. The primary purpose of the trip was to investigate wild life conditions in order that recommendations might be made regarding the stocking of timbered areas with upland birds and mammals. There are great tracts of timber in this area which appear ideal for game refuges. Many interesting birds and mammals were seen, and while time was too limited for extensive collecting, a few specimens were taken for the Academy study series. One of these, a small finch, was submitted for identification to Mr. Outram Bangs of the Museum of Comparative Zoology, and he stated that it was undescribed, and that it was the second one known to science. The other specimen was collected forty-two years ago, in Mexico, and leading ornithologists believed it to be a hybrid. Mr. Bangs described the new form, which was not only a new species, but a new genus, for Mr. Bailey, as *Xenospliza ballepi*, in the Proceedings of the New England Zoological Club (Vol. XII, pp. 85-88).

One of the most interesting areas visited was the lake region about sixty miles north of the town of Durango, where great numbers of ducks and geese

spend the winter. Every little reservoir and lake is the winter home of various species — some from our northern states, and others, local nesting birds. For instance, flocks of the Mexican black mallard, the Diaz duck, were seen associating with pintails and shoveller ducks. Now that there is such a decrease in the numbers of ducks and geese in the United States, it is apparent that careful study must be made of the winter ranges of the birds which pass through the United States, and what protection, if any, is given them.

The last few days of the trip were spent near Mazatlan, at the lower end of the Gulf of California. Fast airplanes make the trip over the high mountains in one hour, while a caravan of pack mules requires several days. This is an interesting region which is well worth intensive study, for at that time of the year there are many tropical birds associating with migrants from the north; north of Mazatlan, in the Gulf of California, are many bird islands which are ideal for photographic work, while the waters of the gulf furnish an unending supply of specimens for the student of marine forms, or for the sportsman.

Colorado

The Academy was invited by Director J. D. Figgins, of the Colorado Museum of Natural History, to cooperate with that institution in making life history photographs of the plant and animal life of Colorado. As a result, Messrs. F. R. Dickinson, E. V. Komarek, E. G. Wright, and A. M. Bailey worked in Colorado during May and the first half of June, and 12,000 feet of motion film and several hundred zoological specimens were added to the Academy collections. Mr. Niedrach, recognized as one of the foremost field naturalists of the Rocky Mountain region, was detailed to work with the members of the Academy, and, owing to his knowledge of the region, exceptional opportunities were offered. In addition, Mr. W. C. Mead and Mr. C. H. Hanington, trustees of the Colorado Museum, accompanied the party on many trips.

The motion films were made by Dickinson, Niedrach, and Bailey, and among the interesting subjects which were photographed were the golden eagle, horned owl, long-eared owl, prairie falcon, ferruginous rough-legged hawk, avocet, Wilson's phalarope, water ouzel, white-tailed ptarmigan, and many other species of birds, as well as reptiles, small mammals, and flowering plants.

A nest of the golden eagle was found along a precipitous wall in Weld County, and a rock blind was erected where the nest could be kept under observation. The photographers remained in the blind for eighteen hours, and recorded the trips of the adults to the nest with food for the young. Rabbits and prairie dogs furnished the major part of the bill-of-fare. One of the fortunate occasions was the finding of a nest of the prairie falcon in a site suitable for photographing, for ordinarily, the nests are on such steep cliffs that it is impossible to reach them; not only was a nest found, however, but the female was extremely light colored — instead of the natural brown, she was cream colored, with piercing black eyes to

emphasize her light plumage. Hours were spent in the blind and excellent studies secured. Niedrach has known this old bird for nine years, and she has made her nest in the same general locality each year, but never has been found in such an accessible place.

Work was carried on in the pinyons and cedars near Canon City, at an elevation of 3000 to 4000 feet, on the prairies at 5000 feet, and on the arctic slopes above timber line at over 14,000 feet. Sage thrashers and house finches nested in the low country in cacti, mountain plovers were photographed on their nests on the prairie, surrounded with snow, ducks were taken in the marshes, and ptarmigan upon the mountain tops.

The films have been edited in a series of five reels which will be shown in the public schools in Colorado, at the Academy, in the public schools of Chicago, and to other organizations, under the title, "The Haunts of the Golden Eagle."

An outline of the Smoky Mountain trip was given in the last issue of the Program of Activities. One interesting result of the field work was the securing of a new species of meadow mouse which lives in fairly dense woods around mossy logs and boulders near the tops of the mountains. The taking of this mouse is a very unusual find, as it has affinities with northern forms, which indicates that it may be a remnant of an ancient fauna. This region is one of interest to all naturalists, for many unusual forms of plants and animals are found there.

Mr. R. L. Boke, a field assistant of the Academy, collected a representative series of mammals of the Santa Lucia Mountains in California, but as yet, the material has not been identified. He worked for several weeks on the William R. Hearst Ranch.

Mr. J. R. Snyder worked on the Buffalo Head Ranch in the Highwood River District of Alberta, Canada, and collected a fine series of birds from that interesting region. He was in the field two months, working from the low valleys almost to timber line.

James Mooney and E. V. Komarek continued their field work on the mammals of Illinois. Mr. Mooney is incorporating his collection of Illinois mammals as a permanent loan in the Academy collections.

Dr. F. J. Psota, Honorary Curator of Entomology, made a short trip, in August, into Mexico in the vicinity of Monterey, to collect insects, the special object of his search being *Monilema*, a group of beetles that live in cacti. He was very successful, and secured an extensive collection of these interesting insects. Some additional work was carried on in the area near Laredo, Texas. Dr. Psota has been specializing on the minute forms of the insect world for many years, and his wonderful Coleoptera collection, cared for in the most painstaking manner, is recognized as one of the best in the United States.

C. L. HOLTZMAN

The Academy regrets to announce the passing of Mr. C. L. Holtzman, a Life Member and a member of the Board of Scientific Governors, whose death occurred on August 2, in Minneapolis. Mr. Holtzman was for many years a teacher of Zoology in the Waller High School, and more recently was associated with the John Motley School as principal. His valuable services in cooperation with the members of the Board and of the Staff will be greatly missed.

THE STATE MICROSCOPICAL SOCIETY

The first fall meeting of the Society was held at the Academy on the evening of September 15, with a good attendance and an excellent program. Mr. W. T. Jayne, of Bausch and Lomb, showed a three-reel film entitled "Eyes of Science." Hon. Robert Ross, British Vice-Consul, addressed the meeting, having for his subject "The Micro-Fauna and Flora of Upper Silesia." Dr. F. C. Test gave an interesting talk on the relation of the microscope to medical science. The next meeting will be held October 6.

GIFTS

The Academy is grateful to the donors of the following specimens received during the past months. Directions for sending live material, collecting, and preserving specimens will be sent to those desiring to collect for the museum.

E. R. Boke—100 mammals, 6 birds
Mary Cooper—1 mammal
W. E. Brock—3 specimens of silver ore
Allen Brooks—4 birds
Henry Dybas—1 bat
Mrs. W. H. Edwards—6 rice rats
Vera Y. Foster—3 mammals, 22 reptiles and amphibians
Mrs. Leonard Frank—1 massasauga
A. J. Franzen and E. V. Komarek—5 reptiles and mammals
Grace L. Gonzales—13 specimens of onyx

Eugene R. Grossmann—4 snakes
W. C. Hanna—22 bird skins
James J. Mooney—89 herpetological specimens, 2 birds
Walter L. Necker—6 snakes and frogs
Russell T. Neville—1 turtle, 3 bats
R. F. Smith—1 rail
Don A. Spencer—350 small mammals
C. R. Stout—1 rail
Geo. Troller—2 bats
P. H. Williams—1 snake

NEW MEMBERS

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Philip K. Wrigley



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

DECREASE IN WILDFOWL

There are, it would appear, two schools of thought upon the subject, "What is the cause of duck shortage?"

While both agree that under natural conditions, wild life tends to replace itself, and that under unnatural conditions, it fails to do so and must, in time, become extinct, one school considers shooting as the responsible unnatural condition, and the other places the responsibility upon the destruction of breeding areas.

Isn't it a question, after all, whether the chicken or the egg comes first? If one argues that an egg can be replaced by the bird that laid it, but that a dead bird can lay no eggs, then it would seem that our first thought should be to refrain from killing the bird. But if the bird is allowed to live and yet can not lay eggs to any purpose, because there is no protecting cover for them and no natural food for the young, if by luck they are hatched, our forbearance has been in vain.

Hence, the writer agrees with a recent pronouncement in a bulletin of the American Game Association, ascribing the shortage of ducks to vanishing breeding areas. There can be no doubt that the most important of these, lying in the great northwest, have been to a large extent, added to arable acreage. This region is

now traversed not only by railroads but by splendid highways, and is no longer a prairie wilderness. Few owners of farm lands are able to forego the urge to drain the marshes within their domain. Even when such marshes are not drained, it is possible, in seasons of light rainfall, to cultivate right up to the meander line and frequently beyond it. Only a few of the species of ducks shot for the table actually seek breeding cover among the cat-tails and rushes growing in the water. It is here that they feed and bring the young to feed, but the nest is built in the brush and herbage of lands adjacent to the sloughs. Destruction of this cover is fatal to a continuing supply of ducks.

One may ask, "Why don't the ducks go elsewhere?" Other areas, if in the region, and if suitable, would be occupied. A given wild life area is capable of supporting a given wild life population. Areas farther away would lie outside its range and consequently, outside the experience of the race.

Many people assert that there are hundreds of acres of marshland which are ideal for duck homes, but which are not used by the ducks. That would appear to be so, but let us consider an example near at hand. Looking across the Skokie, one might easily conclude that this area provided ideal nesting grounds for teal, and so it would if there were any pond holes or streams, as there were formerly, when teal and other ducks nested there. Now there are deep drainage ditches into which a wild duck would no more descend than it would fly into a well.

Many other localities which, at a glance, seem to possess conditions favorable to their use by breeding waterfowl, will be found, upon examination, to be defective. They may be too much frequented by picnickers, flower-pickers, hikers, and the legions of motorists who have nowhere to go and so, go everywhere. They may be burned or cut over. Streams which empty into them may carry pollution, as in the Calumet marshes.

But the few remaining prairie pot-holes, where a teal or two, or a mallard may linger, won't supply ducks for a million hunters. The great source of supply is now largely beyond our borders. Just as the great breeding grounds of Iowa have disappeared and the ducks with them, just as this history is being repeated in the Dakotas, so it will be in Canada.

Unless the areas in the north, where ducks breed, are purchased, set aside, and provided with wardens, unless a survey and study of these areas is constantly carried on, whereby closed seasons and bag limits may be intelligently fixed, and unless, above all, care is taken that the works of man in regions near or far do not permanently dry up the marshes, it is inevitable that the ducks will cease to "darken the air," nor will even one be left to show a wistful speck against a rosy skyline.

E. F. Ford

The open season on wild fowl has been cut to thirty days throughout the United States, due to the alarming decrease in the numbers of birds. This is a

compromise between the demands of sportsmen who have desired no limitations, and the conservationists who have asked for a completely closed season of three years. The U. S. Biological Survey has cooperated with the Canadian Government in making a survey of conditions on the main breeding grounds of wild fowl, and found the condition worse than had been anticipated. Mr. Ford's article shows that birds can not increase if their nesting places are taken from them — either for agricultural purposes or by drouth. Unfortunately, our ducks and geese have become so few, and gunmen so many, that they can not withstand the drastic curtailment of their breeding areas; unless better protection is given, the next generation will not have the privilege of hunting in the marshlands.

There is no doubt that extensive hunting has been one of the causes of the decrease in ducks. There are still many areas which are suitable for nesting ducks, where they were once numerous; the sites are just as favorable, but there are few birds to be found.

This decrease can be laid to over-shooting, for ducks and geese return to the same general locality year after year, if banding data is reliable, and when the stock of a given area is depleted, birds from other regions do not come in to take their places. It is well known to sportsmen that the young of local nesting birds are killed the first few days of the season; they are unsuspicious, and are easily secured, so the hunters must await the flight from the north for further hunting.

If the stock of a given area is to be built up, the young must be protected so they will return to their birthplaces. The breeding birds can never increase if the season is open early in the fall, and all the season's young are killed before they have a chance to leave their home marshes. There is no greater recreation than duck hunting, but great care must be used if birds are to be preserved for the future.

THE STARLING IN THE CHICAGO AREA

The starling is soon to be one of the common birds of the middle west, if their rapid spread in the Chicago area is any indication. The first large roost in the region, so far as I know, is one at Homewood, Illinois. Mr. C. J. Albrecht reported to me that flock after flock of starlings passed his house each evening, enroute to their nesting places. On August 17 I saw a few birds, but was too late to witness the big flight, so we walked a couple hundred yards from Mr. Albrecht's home to that of Mr. Charles Harmke. The chatter of congregated birds was evident when we were one hundred yards away, and we found great numbers of starlings, robins, grackles, English sparrows, and a few martins swarming into the box elders, cottonwoods, willows, and maples. Whenever we clapped our hands, the birds would rise in flocks of twenty to one hundred. To be conservative, we estimated there were one thousand starlings, but there were probably a great many more. Mr. Harmke said that the birds had been using the trees for their roosts for three years, and were such a nuisance with their filth that he believed he would destroy the trees.

A. M. B.

NESTING SONG SPARROW

For about ten years a song sparrow has built her nest inside the greenhouse of A. J. Schmidt, on Herbert Road, in Riverside. The habit began when hanging baskets were in vogue, and one of these was the nesting site selected. As the porch styles changed the florist discontinued the baskets, and the bird built among the plants on the benches. Last year the nest was so well hidden among the dense foliage of an English ivy covering a wall, that it was not found by the busy workmen until the noisy nestlings were leaving. It took two days for the mother to coax all the babies out of the house after she had them out of the nest, and the greenhouse was full of excitement during that time. She was back again this year, but the nesting site was not discovered. This, of course, can not be the same bird that has used this shelter for so long a time, but it is likely that it is a descendant of the first family. It would be an interesting case for banding.

Nellie J. Baroody

BIRD SURVEY ON THE GREAT LAKES

Mr. W. I. Lyon made his annual cruise among the bird islands of Lake Michigan, in co-operation with the U. S. Biological Survey and the U. S. Coast Guard Service, to study and band the nesting birds. Mr. E. R. Ford, Honorary Curator of Oology, Mr. Komarek, and Mr. Bailey accompanied him to aid in the banding, and to make motion films of the wonderful bird colonies. Interesting photographic records were made of the many Caspian and common terns and herring gulls which nest on the rock and sand isles, and five thousand government bands were placed upon the birds. The banding of birds has become an important field in the study of the migration of many species, in investigations in the changes of plumages, the age of individuals, and family groups. An increasing number of banding enthusiasts are working with the Biological Survey, and the value of their combined efforts can not be over emphasized. Mr. W. I. Lyon is president of the Inland Bird Banding Association, and is the veteran "bird bander" of this area. Any one interested in attracting birds to their yards and in securing information concerning the work, should consult him.

ANNUAL MEETING OF INLAND BIRD BANDING ASSOCIATION

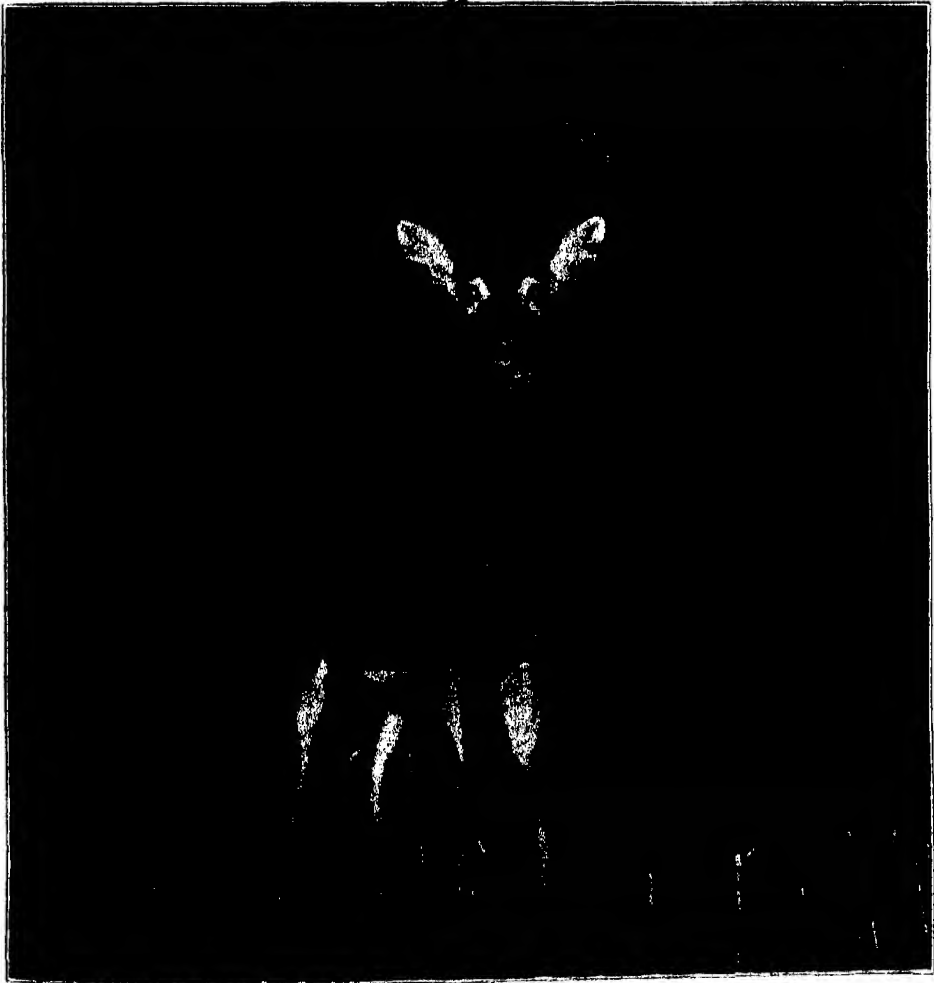
The Secretary of the Inland Bird Banding Association has called the annual meeting for November 27 and 28, to be held in the Academy lecture hall. The Illinois Audubon Society and the Chicago Ornithological Society will meet with the Bird Banding Association, and an interesting series of papers will be read, and motion films shown. Details of the program will be announced at a later date. It is hoped that all who are interested in the protection of birds and in the study of their ranges, will plan to be present and contribute papers. Write to the Secretary, Mr. E. R. Ford, at the Academy, giving the title of your paper.

Program of Activities of The Chicago Academy of Sciences

Vol. 3.

January, 1932

No. 1.



Photograph by T. Gregory and W. Hodges

IN THE VELVET

The antlers of the northern deer are well grown by late summer, but they still retain their velvet coverings. This beautiful animal with well proportioned antlers, fed quietly along the shores of the shallow lake, until the photographers paddled near, and then he raised his head, staring into the blinding light.

The Chicago Academy of Sciences

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AUTUMN MEETING

The Autumn Meeting of the Academy was held on Tuesday evening, November 17, with the members of the Illinois Audubon Society and the Chicago Ornithological Society. The motion films made by F. R. Dickinson, A. M. Bailey, and R. J. Niedrach, on the recent Colorado field trip, were shown by Mr. Bailey under the title, "The Haunts of the Golden Eagle," and if expressions of approval are indicative, the members of the three organizations felt the evening a success. Many expressed their opinions that a joint meeting should be held each fall.

The mountain lion group, which forms a portion of the fourth Chicago Environs series, was opened to the public at this time. The next number of the Program of Activities will be illustrated with photographs of the exhibit.

WINTER PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during the winter of 1932 in the Assembly Hall, Sundays at 3:00 P. M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

January 10—Trails of a Fossil Hunter Prof. Carroll L. Fenton

The collector of fossils leads an interesting life; he searches out-of-the-way places for records of the life of past ages.

Illustrated

January 17—More Wild Life Adventures Mr. Howard H. Cleaves

Mr. Cleaves is one of the foremost nature photographers, with wide experience in many fields.

Illustrated

January 24—Haunts of the Golden Eagle Mr. Alfred M. Bailey

The Academy expedition to Colorado secured many wild life photographs which will be shown to the general public for the first time.

Illustrated with Motion Pictures

January 31—Desert and Forest Life of West Africa Mr. Wilfred D. Hambly

Remote regions are visited by museum field men in their search for specimens. Mr. Hambly will tell of a recent Field Museum expedition.

Illustrated with Motion Pictures

February 7—Across the Cameroons and Down the Nile Mr. Herbert Bradley

Mr. Bradley, explorer and world traveler, has recently returned from African jungles with a wonderful series of motion films.

Illustrated

February 14—A Naturalist in the South Seas Mr. Karl P. Schmidt

Mr. Schmidt will tell of the life found in tropical waters and coral sands, as encountered on a recent museum expedition.

Illustrated with Slides and Motion Pictures

February 21—The Early Voyages of American Whalemen Mr. C. S. Howland

There is no subject more interesting than the lives of the men who hunted for the great whales.

Illustrated with Motion Pictures

February 28—The Rebirth of Palestine Capt. Richard St. Barbe Baker

Captain Baker is a traveler of many countries, and is an authority on the near east.

Illustrated with Slides and Motion Pictures

RATTLESNAKES NEAR CHICAGO

Three live rattlesnakes were received several weeks ago from James J. Mooney, field representative, who secured them near Deerfield. Two were plowed up by a farmer in an old grain field, the third was found by Mr. Mooney near a road. He sent the specimens in a box to the Academy, and while they are not on general display, they are in the laboratory where they may be seen by interested week-day visitors.

Rattlesnakes are found in two areas near Chicago, the region along the Des Plaines River, and the marshy tracts of the Indiana Dunes. These three individuals are between twenty-five and thirty inches long; massasaugas may attain a maximum size of three and a half feet. Their usual habitat seems to be in swampy country, although the specimens from Deerfield were found in comparatively dry locations.

These Chicagoland rattlers may, under favorable conditions, cause the death of a man; they are, however, by no means common in our region and no recent and authentic record of man having been killed by the massasauga is on file. There is only one poisonous snake in the Chicago area,—the massasauga—while there are twenty-two species in the United States; they are divided into four genera: *Micrurus*, the coral snakes; *Agkistrodon*, the copperhead and cotton-mouth moccasin; *Sistrurus*, the pigmy rattlers, including our massasauga; and *Crotalus*, the true rattlesnakes.

Our specimens have proved remarkably docile, for they allowed a small mouse, which was intended for food, to enter their family life without show of resentment, other than irritable rattling. All would have been well and the Academy would have had an unique exhibit of a mouse and rattlesnakes living in harmony, except that Mickey, as our mouse was called, considered the rattles as something to chew upon. At any rate, he de-buttoned two of the snakes and started on the third before the snakes were rescued from his playful onslaughts. The rattlers did not take kindly to his endeavors, it must be admitted, for they swung their tails back and forth, with Mickey hanging on as though he were enjoying the ride. He was forcefully ejected from the cage before he could do further damage.

FIELD WORK IN NEW MEXICO

Mr. James E. Baum, explorer and author, has recently been working in New Mexico, and among the specimens which he collected for the Academy were two fine antelopes. A young one, to complete the habitat group will be taken in the spring. Mr. Baum's work was made possible through the courtesy of Mr. Elliott S. Barker, head of the New Mexico Department of Conservation.

WAYSIDE MUSEUMS OF THE FOREST PRESERVES

The Academy has been invited by Capt. Charles G. Sauers to undertake, in co-operation with the Commissioners of the Cook County Forest Preserves, the building of a trailside museum at Chicago and Thatcher Avenues. Captain Sauers, Superintendent of the Preserves, F. R. Dickinson, and A. M. Bailey will have general supervision of the museum, which is intended to promote conservation and to interest the public in the care of its forests. The Forest Preserves extend in an unbroken chain along the western border of Cook County, and it is intended that a hiking trail run from the northern to the southern end, with wayside museums placed at intervals, if the initial experiment now under way is successful.

Exhibits of live material will be the feature of the museum, but they will be augmented by charts and mounted specimens. A nature trail will wind along the Des Plaines River, with trees and plants labelled, so the public may become familiar with the interesting things which are so plentiful in the preserves.

DR. HAAS RESIGNS

It was with regret that the Board of Trustees accepted the resignation of Dr. W. H. Haas as Vice-President of the Academy, at their recent meeting of November 27. Dr. Haas, geologist at Northwestern University, has been a member of the Board of Scientific Governors for many years, and has been Vice-President of the Academy since 1922; he has been instrumental in bringing many valuable accessions to the Academy.

Dr. Haas asked to be relieved because of the pressure of other work, but he has assured the Board that he would continue his interest in the welfare of the Academy.

F. R. DICKINSON ELECTED PATRON

At a recent meeting of the Board of Trustees, Mr. Francis R. Dickinson, a member of the Board of Scientific Governors, was elected a patron of the Academy, "for services rendered."

Mr. Dickinson has accompanied the recent field trips to Louisiana and Colorado, and has taken part in the making of motion films for the Academy's film library. In addition to his photographic work, he has had an active interest in the botanical collection, and in the proposed trailside museum.

ACCESSIONS

The Academy is grateful to the donors of the following specimens received during the past months. Directions for sending live material, collecting, and preserving specimens will be sent to those desiring to collect for the museum.

William Anderson—1 cephalopod and trilobite
Jack Baum—2 antelopes
Charles D. Brower—107 Alaskan birds and eggs
Leonard Frank—1 necturus, 1 woodchuck
W. C. Hanna—6 bird skins
Hubert Kasper—1 olive-backed thrush
George Litman—2 turtles

Donald Lowrie—6 frogs, 2 blue racers
J. A. Munro—14 bird skins
Walter L. Necker—250 herbarium specimens
Arthur Rueckert—1 European woodcock
Walter Schlesinger—1 snake
Don A. Spencer—49 mammals
Capt. L. R. Wolfe—4 bird skins and 52 mammals
E. G. Wright—1 turtle, 7 snakes



Photograph by T. Gregory and C. H. Hodges, Jr.

PHOTOGRAPHING WILD ANIMALS

Tappan Gregory

There is an enthralling fascination in photographing wild animals at night. Imagine yourself behind a jacklight in the bow of a light, flat-bottomed row boat or canoe, while it glides silently over the unruffled surface of a little inland lake in the heart of the North Woods. Choose a still, warm night in the dark of the moon. Your cameras are fixed on a turntable in the bow, your flash lamp loaded with magnesium powder, ready to record the image of a white-tailed deer, if luck is with you. Watch the rays of the jack playing on the shore, making fantastic shadows as the craft slides along. Perhaps you will be startled by the unexpected scream of a barred owl in a tall pine tree over your head, or the whack of a beaver's tail as he dives unobserved close at hand. Certainly a loon will laugh at your approach.

Your nerves are tense, your faculties strained to catch the slightest sight or sound indicating the presence of deer. Do not be too ready to ignore the crack

of a breaking twig. It may, as you think, mean nothing but a wandering porcupine, but occasionally it will prove to be the signal of a feeding deer. Presently, over the still waters comes the sound of the measured tread of a wading deer. It is unmistakable. It can mean nothing else. Soon his eyes shine in the distance like glowing coals. Now, as the boat drifts closer, his outline becomes dimly visible. At last you can see him clearly, though still too far away to fire the flash. The cameras must be brought within twenty-five feet.

In this last critical approach, the responsibility is largely the paddler's. He must be doubly conscientious. The least noise or false move may spoil the chance. When the dull boom sounds, the white flare of the flash lights the scene and blinds deer and "hunters;" chaos reigns momentarily, while the quarry splashes frantically for cover, but there is great satisfaction in knowing that he cannot escape. His image is definitely committed to the film, though he himself may still roam at large.

It isn't always quite as simple as I have suggested, especially in dealing with doe and spotted fawn together. When they bring the little ones into the water, the does seem abnormally sensitive to our presence.

In twenty-five years of effort, I have only succeeded once in taking doe and fawn together. Then the doe stood watching our approach while the little fellow trudged up from a distance to join her. Lily pad roots hung from her mouth. He nibbled at these momentarily. Then with the fawn's usual impatience and nervous energy, jerked his little head as the hammer fell to discharge the flash. It is always like that. No picture is ever perfect, but the patience of the doe was most unusual.

Much more characteristic were the actions of one encountered on a chill night in September. Wolves were prowling the distant ridges. No deer were at large in the water. We were discouraged. Then from up the river above the beaver dam came the welcome sound of wading. Patience was at a premium. The wait seemed interminable, but at last the splashing approached. No breeze gave us away. No sound came from the boat. We held it still with the jack playing on a gap in the bushes where the deer might come into the stream.

All we could see as they came, were the shining eyes. Not one nor two, but three pairs — one pair in normal position, the others following in single file, close to the water. We knew then we dealt with doe and twin fawns, but they disappointed us, so far as pictures were concerned. They chose to stay in a slough, separated from the main river by a belt of rushes. We backed carefully away to retain our strategic advantage. Behind us the river widened out and here we knew the deer must come to us or forego the pleasure of attending at their favorite feeding ground. As we lay quiet, watching, the doe walked through the rushes and stood looking at us. She could not see behind the jack and still there was no sound from the boat and no breeze to betray us. Yet, after a second's inspection, she leaped straight towards us, walked a few steps, jumped once more, then swerved off past the stern of the boat to dash down the shore a short distance, followed by one of the fawns. The other little fellow remained behind, hidden in the rushes. The jack was swung, of course, to follow the doe. We were still

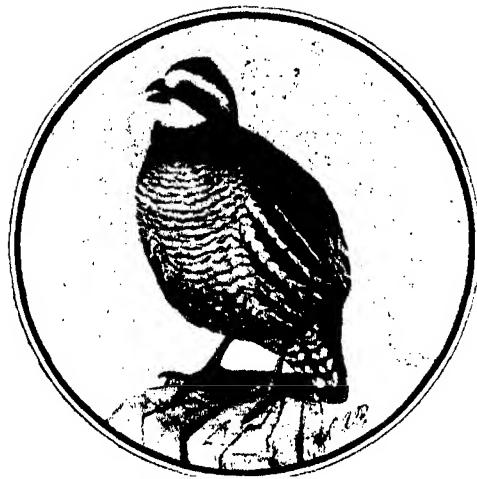
invisible to her. Once more she was seized with the urge to action. Up she came with a rush, alone in her flight, parallel to the length of the boat. Now her sharp turn in our direction made it evident that she would come aboard amidships. As she struck the gunwale and fell half in and half out of the boat, I swung the light off her for the first time and turned a cold shoulder as a measure of self protection. It did not take her long to scramble out and rush on past the bow of the boat in a cloud of spray, leaping for the dark shore in great, high jumps.

The little fawn, deserted down the shore, made his way into the brush and bleated anxiously as he worked up stream. Then the wolves howled on a nearby ridge, while we turned, disconsolate, to make our way back to camp.

Circumstances may preclude the enjoyment of this fascinating sport with the jacklight. There is an alternative method with much to commend it. The set camera will function by itself in any season, at any hour of the twenty-four, irrespective of weather. It can be so arranged that the animal himself will trip it and take his own picture by moving a wire either attached to a bait or stretched across his trail or in front of his den. Much of the excitement attendant upon sight of your subject in action is missing when the set camera is used. However, there are compensations. The mere sound of the flash is fascinating and the suspense acute when you do not know, until the developer is at work on your negative, what manner of nomad has been impelled by chance or your artful baiting to nudge the delicate trip and leave you a record of his presence. Frequent surprises are in store. You may set for deer and a bear may blunder in. You may become weary and impatient when weeks of effort bring you pictures of nothing but song-birds, falling branches, or leaves driven by the wind. Then if fortune smiles on you, perhaps you will find, as I did, the active den of an amiable weasel, who will favor you with nightly visits for a week or so. Once a beaver cut a sapling to which my wire was attached. The flash exploded at the instant of impact between the falling tree and the shoulders of another beaver. No harm resulted. Unusual shots of this sort go far to sustain interest in the set camera. Its range of usefulness is unlimited, and in its operations you need not seek out wild and secluded habitats.

I assure you the thrill of the chase by means of the set camera has been almost as keen for me in the pursuit of pictures of the lowly meadow mouse in my own back yard as of the lordly moose in New Brunswick, the canny coyote in Montana, or the burly black bear in Michigan,

We are indebted to Mr. Charles C. Thomas, publisher, for the privilege of using the above photographs which were published in Mr. Gregory's book, "Deer at Night in the North Woods." Members of the Academy will be interested in this work by one of their fellow members, for it treats with the fascinating hobby of stalking and photographing deer at night; it is illustrated with forty-five wonderful photographs which were made over a period of years. Mr. Gregory, who is honorary curator of mammals of the Academy, has studied deer in northern woods for over twenty years, and his work gives authoritative information concerning their habits and the methods of hunting them with a camera.



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

FALL ACTIVITIES

The Audubon Society has co-operated in two meetings this fall, the Autumn Meeting of the Academy on November 17, as reported on the second page of this number, and the Annual Meeting of the Inland Bird Banding Association on November 27 and 28. This organization held its tenth Annual Meeting at the Chicago Academy of Sciences, and in response to an invitation from the bird banders, the Illinois Audubon Society took an active part.

At the session of Saturday morning, Mrs. W. D. Richardson, Vice-President of the Illinois Audubon Society, greeted the members and visitors in behalf of our organization, promising its co-operation with the banders and asking that they aid the Audubon Society in its work of bird protection.

Other active Audubonites who held a place on the program, were two of its directors, Mr. W. I. Lyon and Alfred M. Bailey. Mr. Lyon, as is generally known, has been President of the Inland Association for many years. Mr. Bailey opened the meeting Friday morning with an expression of welcome to members, visitors, and guests, and gave, during the afternoon, a paper entitled "Bird Studies with a Camera," illustrated with motion pictures from the Academy's film Library.

It is likely that the paper having most interest, from the point of view of bird protection in Illinois, was that of Mr. T. E. Musselman. This dealt with conditions along the Mississippi and Illinois Rivers during the duck shooting season. The speaker's statements were offered with an evident flavor of impartiality. He stated that at many (though not all) of the duck clubs, there was an evasion of the law relating to bag limits. Paterfamilias has seen fit to provide hunting licenses for non-shooting members of his brood, and father shoots the limit for each license holder. Crippled birds may not be recovered. If they survive, they will provide decoys. If not, they will provide carrion for crows and other scavengers. Commercial clubs guarantee the limit. If the hunter doesn't bring in fifteen, there is always a supply of dead birds on hand at the club house with which to make up the shortage.

The micro-movies of Mr. S. Prentiss Baldwin, Honorary President of the Inland Association, and Director of the Baldwin Bird Research Laboratory, were startling. These were shown at the A. O. U. Meeting last month and excited great interest. By means of special methods and apparatus, motion pictures are taken showing the development of the avian embryo. After 36 hours' incubation, heart action and blood circulation can be seen. To the eye, circulation currents appear to have been set up before the vascular walls have been established. Mr. Baldwin said that his hearers sometimes describe the micro-movies as uncanny.

Mr. Sidney R. Esten, of the Indiana State Conservation Department, pointed out, in the course of his talk, the danger of allowing children to form their ideas of the appearance of the different kinds of birds solely from colored pictures. The artist has made his subjects appear in their freshest and brightest plumage. Variations from this representation are infinite. As Mr. Esten says, "No two birds of a given species are exactly alike." Variations are not determined by sex, age, and seasonal molts only. Individual size, markings, color phases, incidental environmental appearances, such as soot and rust stains, and many other elements differentiate birds actually of the same kind. Mr. M. J. Magee's paper, which was read at the meeting, touched on the differences he had observed in trapped birds, notably juncos and yellow warblers.

An exhibit of Mr. Walter A. Weber's delightfully convincing bird paintings was placed in the Academy lecture hall, and his paper treated of "Color Studies of Living Birds." Mr. Weber advocated simplification of color charts in the description of bird colors. His own method, which his own work shows to be most successfully applied, consists of the use of Winsor and Newton color charts, which may be obtained from dealers in artist's supplies, and field notes wherein, for example, the term "brownish olive" has a connotation different from that of "olive brown." In transferring to canvas, the impression created by these notes, he would use, in one instance, more brown than olive, and, in the other, more olive than brown. In depicting shades of blue, white is not mixed to produce a lighter color. Instead, the color is laid on lightly, so that the white of the canvas will produce the required result.

Mrs. Lucy Baxter Coffin told of "Song Returns," recording her experiences with song sparrows, field sparrows, and other species wherein individuals were identified by their several songs, and their re-appearance from year to year established. Mrs. Coffin has observed that at an early age, the young song sparrow attempts a song, the notes of which are unrecognizable by sound alone.

Mr. Cleveland P. Grant, whose lecture was entitled "Prairie Game Birds," offered unusual motion pictures of prairie chickens, booming and strutting in their courtship maneuvers, and of the upland plover young emerging from the egg. Mr. Grant's pictures were taken within the Chicago region.

The annual dinner of the Inland Association was held at the Parkway Hotel on Saturday evening. About 35 members and guests were present, and it is significant that most of these returned to the Academy afterward to see three reels more from the film library. When these had been shown, there was still a cry for more, and the Director obligingly gave an additional reel.

We have not been able to mention here all the activities of the meeting, nor the names of all the speakers, but we think it may be said for members of the Illinois Audubon Society that they enjoyed this opportunity to join forces with men and women whose work, though in one sense of a special kind, is doing much to enlarge the circle of "bird conscious" folk throughout the land.

WINTER NOTES

The "melancholy days have come," but there are many opportunities presented the bird student to make noteworthy records. It would be of interest if members of the Society in different sections of the state would make notes on the birds observed during their winter jaunts, so that records from various counties might be compared. Weather conditions, topography of the region, distance travelled, and length of time in the field, as well as the different species and number of individuals should be included in the notes. On Sunday, December 20, a gray, warm day, two members walked along Salt Creek, near La Grange, Illinois; the country is wooded for the most part with the small stream meandering sluggishly along. The observers were surprised to hear a kingfisher rattling his way from one outstretched branch to another. He was flushed on several occasions. Other birds noted were: red-winged blackbird (1), flicker (1), downy woodpecker (4), hairy woodpeckers (2), crows (8), chickadees (12), titmouse (6), white breasted nuthatch (8), tree sparrows (15), cardinal (20), goldfinch (2), English sparrows (100). The latter seem to be becoming more abundant in the fields and along the edges of the woods, doubtlessly being forced to range from the villages in search of food. The hikers were out about one hour.

FIELD NOTES

During August I observed a Carolina wren's nest in a shed along the Tippecanoe River near Winnemac, Indiana. The nest proper was a bulky affair, a little smaller than my head. It was built on a two by four, seven feet from the floor. A vestibule eight inches long led into the nest. I hardly suspected the nest was occupied until I turned my flash light into it, but the mother was brooding on four eggs; not liking the glare of the light she flew out knocking against my forehead. I was so fearful she might desert the nest that I did not disturb it for several days. Then there were four young. The vestibule dropped off so it was easier to observe, and the last day I turned on my flash the young were about ready to leave. They sat perfectly rigid, all staring at the light, while both parents outside warned, "Fear, fear!" How I regretted leaving the cottage before the young left the nest.

During the spring of 1931 I imagined that I was roused from slumber by the booming of prairie chickens south of Forest Hill subdivision on Wolf Road. It seemed improbable as I had not seen prairie chickens in the locality of Hinsdale and Western Springs in twenty years. Imagine my delight, September 29, on walking along the edge of a meadow and corn field, to flush seven prairie chickens. One by one they sprang from my feet. They were larger than quail, yet had the characteristic quail flight. They did not have the long pointed tail of the pheasant. Some days later my observation was verified by a sportsman who had observed a covey in Vaughn's nursery, not far distant.

There has been general rejoicing in the farming community concerning the wholesale shooting of the ring-necked pheasants. A score of these imported birds frequently resides in one cornfield, puncturing bushels of ears of corn in the milk. The destruction of these birds to corn alone can not be estimated. Farmers recognize in the quail a friend to agriculture twelve months in the year. The quail has practically disappeared since the introduction of the pheasants.

Esther A. Craigmile

[The pheasant problem is an interesting one for there is no doubt that many farmers, especially in northern Iowa, dislike them because of their destructiveness to corn. It is also true that the pheasants are destructive to eggs and small young in some instances, but whether their depredations are the cause of scarcity among certain species of birds is unproven. It would be much better if some of the funds expended on pheasant propagation were spent on our native birds. The prairie chicken and the quail are in need of protection *now*, and unless they are protected by a year around closed season, they will be exterminated in this part of Illinois. It is of interest to note that the legislature has now protected the hen pheasants, but our quail and prairie chicken are still subject to bombardment during an open season. The prairie chicken seems doomed in Illinois unless a permanent closed season is given, and even with such protection it is doubtful if they can increase.]

Program of Activities
of
The Chicago Academy of Science

Vol. 3. April, 1932

20. JUNE 1932
P. INST. AGRI. 1932



THE DESTROYING ANGEL MUSHROOM (*Amanita verna*)

The Chicago Academy of Sciences

FOUNDED IN 1857

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ANNUAL MEETING

The Academy will hold its seventy-fifth Annual Meeting on Monday evening, April 11, at 8 P. M., in the Academy lecture hall. Announcements will be mailed to all members a week before the meeting, and it is hoped that as many as possible attend and bring their friends.

The annual address before the Chicago Academy of Sciences will be given by Dr. W. D. MacMillan, Professor of Astronomy at the University of Chicago. His subject will be "Our Expanding Ideas of the Universe," and will be illustrated with lantern slides.

Dr. MacMillan is one of the foremost American astronomers, his special field being mathematical astronomy. One of Professor MacMillan's contributions to knowledge has been in connection with his theory of the origin of the sun's heat. He was the first to propose the hypothesis that the energy of the stars arises from the consumption of the stars' own substance, a process which involves the death of the atoms of which the star is composed.

According to this 'cycle of energy' hypothesis the atoms are born in the depths of astronomical space, their energies being derived from the radiant energy of the stars as they travel through space. This accounts for the origin of the nebulosity which is visible on the night skies and the cosmic radiation which has

been the subject of much discussion in recent times. The stars gather in this nebulosity as they travel about, and the energies of the stars are derived from the energies of the atoms, thus completing the energy cycle. These ideas have become a commonplace in recent years. From it has come an entirely new cosmology—one in which the time scale of our ideas is as vast as the space scale that modern astronomical observations have revealed to us.

Professor MacMillan has become very famous among astronomers and with the public generally in connection with his theories of cosmology.

He has opposed the views of the English physicists, Eddington and Jeans, who believe that the universe is running down. Dr. MacMillan does not favor this belief, but feels that the universe may be eternal. He also believes that there may be life on other heavenly bodies than our own. He has been one of the most popular lecturers at the Adler Planetarium and he has a remarkable knack for popularizing the fascinating field of astronomy.

SEVENTY-FIVE YEARS OF SERVICE

The Academy has held its place in the life of Chicago for three quarters of a century. On April 11th will be held the seventy-fifth Annual Meeting, the Academy having been organized January 13, 1857. In the year 1859 the society was incorporated, and in the year 1865 the charter now in operation was secured from the state legislature. The first director, Robert Kennicott, lost his life in the interior of Alaska, in 1886, while leading the scientific section of the Western Union Telegraph Expedition. Wonderful natural history collections were secured for the museum during the first fifteen years of the Academy's existence, but these were all lost, along with an extensive library, in the great Chicago fire of 1871. A museum was again started, and the organization continued to stimulate interest in the natural sciences.

In 1892, Mr. Matthew Laflin offered to give 75 thousand dollars toward the erection of a building, and the Commissioners of Lincoln Park offered to provide the ground as well as to add twenty-five thousand dollars and complete the fund for the building, and also pay for the maintenance of the Academy. Endowments were later made by Mr. Moses Wilner, Mrs. Melissa Dickinson, and Mr. Louis E. Laflin, and so, the Academy, through the generosity and farsightedness of a few of Chicago's citizens, has been able to continue the work which was started so many years ago. No public appeal for funds has ever been made by the officers of the Academy; they have felt that the work accomplished speaks for itself, and that the appreciation of the youth of today will take care of the needs of tomorrow.

The Academy is supported by its members, its affiliated societies, and its small endowments, and while its financial resources have always been small, a great deal has been accomplished through voluntary work of its members. If any such organization is to persist, it must be worth while, and it must have support. The Academy has persisted for seventy-five years, and it is hoped that the interest of its members will continue for the next three quarters of a century.



THE COUGAR

The habitat group recently installed in the Academy's Chicago Environs series has caused many interesting comments. Many visitors are surprised to know that these large cats were once found along the shores of Lake Michigan, but there are numerous definite records from Michigan and Wisconsin, and Cory (Mammals of Illinois and Wisconsin) gives several from Illinois, including one from Cook County.

Cory states: "The panther, or cougar, was not uncommon throughout the wooded portion of Illinois and Wisconsin. The fact that it was considered rare by the early writers has little weight, inasmuch as its habits were such that in a country where the character of the soil and vegetation were such that its tracks could not be seen, its presence would be very likely overlooked. On illustrating this, I may say that I hunted for many years in southern Florida where panthers were common, so much so that rarely a day passed without finding tracks of one or more of these animals, either on the sandy ridges or in the soft ground bordering the cypress swamps, and yet, for two seasons, not a single one of these big cats was seen. It was only after a pack of trained hounds had been pressed into service that three were killed in one week in the same locality."

Among the records listed by Cory were a single specimen from Cook County (Kennicott), and others from Macoupin County (J. E. Andrews), Alexander County (J. C. Boyd), and Jo Daviess County (R. M. Barnes.)

The cougar is now restricted to out of the way regions where it finds an abundant food supply. It is still common in many mountain areas of the west, but as it is hunted by trained government men, it is rare over most of its former range. The mountain lion lives on the larger game mammals, when available, but if deer, elk, and other large forms are not to be had, he turns to smaller victims, or to domestic stock.

An interesting question which has caused considerable controversy among naturalists is: Does the male cougar stay with the family group while the young are still small? The American Museum has a group depicting a male carrying a fawn to the female and her kits, and the label states that the male hunts for the female and young. In the beautiful group recently constructed in Field Museum, only the female and young are shown; in published reports regarding their group, it was stated that the male does not associate with the female and small young. Seton, on the other hand, gives several accounts of hunters who have seen both adults and young in family groups. (Lives of Game Animals)

In preparing our group, we have been inclined to agree with Dr. Osgood, that the male would not be tolerated while the young are small, and we have shown the female reclining upon a limestone ledge with the young crouched behind her, as they eye a large male who has wandered too near.

While the cougar is a powerful, savage animal, there are very few records of its molesting man; it is a cowardly creature, and will not make a stand unless cornered or protecting its young. Seton gives several accounts of the cougar attacking man, but he sums up his chapter with the paragraph-

"Under no normal circumstances will a cougar declare war on man personally and under no circumstances, normal or otherwise, will it turn on him the full measure of power and ferocity that it holds in reserve for such other fellow brutes as may cross its will."

THE CHILDREN'S LIBRARY

The Academy maintains a small library of natural history books, and a reading room for the children. Hundreds of youngsters, using the exhibits as a basis for their school work, find the library of great value to them. As the office secretary is in charge, the only overhead expense is the purchase of new material and the keeping of old books in order, so only a small sum of money is needed annually for the upkeep of this department. We feel that many members of the Academy are desirous of helping in the various activities, and we suggest the Children's Library as a project worthy of support. An endowment of two hundred dollars annually will provide books and magazines of the right sort for thousands of children. Anyone interested in sponsoring the library this coming year is asked to consult the director.

PEPOON'S "FLORA OF THE CHICAGO REGION"

The front page of this number of the Program of Activities contains a reproduction of the destroying angel, a mushroom found in the Chicago area. Do you know the plants of the vicinity of your home? This important study of the plant life should be in the library of all nature lovers. Many of us are going to take our vacations in the vicinity of our own homes, and we shall be surprised at the wealth of interesting material at hand.

The Flora of the Chicago Region is one of the outstanding publications of the Academy. The price has been three dollars and fifty cents, but the Board of Trustees has decided, owing to present conditions, to offer a limited number at two dollars each. The actual publication cost was more than three dollars.

The book contains five hundred fifty four pages, is beautifully illustrated, and was written by Dr. H. S. Pepon who is recognized as the authority on the plant life of the region. A copy will make a valuable gift for nature loving friends. When the limited number set aside at two dollars is disposed of, the remaining few will be sold at the original price.

Following is a list of the Academy's publications:

PUBLICATIONS ISSUED BY THE CHICAGO ACADEMY OF SCIENCES

Early Proceedings, Vol. 1. Out of Print.

Transactions, Vols. I and II. Out of Print.

BULLETINS, VOLUME I:

- 1.—Glacial Markings of Unusual Forms in the Laurentian Hills. By Edmund Andrews. 1883. 9 pages, 7 figures. .25
- 2.—Observations of Fluvial Deposits in Peoria Lake, Illinois. By Joseph D. Wilson. 1883. 10 pages, 3 plates. .25
- 3.—List of Batrachia and Reptilia of Illinois. By N. S. Davis, Jr., and F. L. Rice. 1883. 10 pages. .25
- 4.—Report of the Committee on the Microscopic Organisms in the Boulder Clays of Chicago and Vicinity. By H. A. Johnson and B. W. Thomas, Committee. 1884. 8 pages, 8 figures. .25
- 5.—The Northern Pitcher-Plant, or the Side-Saddle Flower. *Sarracenia purpurea*, L. By William K. Higley. 1885. 16 pages, 2 figures. .25
- 6.—Boulder Clays. On the Microscopic Structure of Certain Boulder Clays and the Organisms contained in them. By George M. Dawson. 1885. 14 pages, 8 figures. .25
- 7.—Some Points on the Micro-Chemistry of Fats. By John H. Long. 1885. 20 pages, 24 figures. Out of Print.
- 8.—Chicago Artesian Wells. On their Structure and Sources of Supply. By Leander Stone. 1886. 12 pages, 2 figures. .25
- 9.—On Rhizocarps in the Erian (Devonian) Period in America. By Sir William Dawson. 1886. 17 pages, 12 figures. .25
- 10.—A Paper on *Elephas Primigenius*. By William K. Higley. 1886. 8 pages, 1 plate. .25

BULLETINS, VOLUME II:

- 1.—The Flora of Cook County, Illinois, and Part of Lake County, Indiana. By William K. Higley and Charles S. Raddin. 1891. 168 pages, 2 figures, map. Out of Print.
- 2.—Preliminary Outline of a New Classification of the Family Muricidæ. By Frank Collins Baker. 1895. 23 pages .25
- 3.—The Gross Anatomy of *Limnæa Emarginata* Say, Var. *Mighelsi*, Binney. By Frank Collins Baker. 1900. 36 pages, 6 plates. .50
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- 8.—An Annotated Flora of the Chicago Region. By Herman S. Pepon. 1927. 576 pages, 89 halftones, 7 maps, 50 figures. Cloth 2.00
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FIELD WORK

With a view to following up the preliminary survey made in the Great Smoky Mountains of Tennessee and North Carolina a year ago by members of the Academy staff, the Academy-Psota Expedition left Chicago on February 15 of this year to resume work on the faunal survey of that interesting region.

The Great Smoky Mountains, about which much has been written in earlier numbers of this Bulletin, is a veritable paradise for the naturalist. Its abundance of luxuriant vegetation—trees, shrubs, vines, and smaller plants, affording a riot of colorful beauty, delight the botanist from early spring until late autumn.

It is to be expected that such a wealth of plant life as prevails there would be the home of a varied and interesting faunal life. Birds, small mammals, insects, reptiles and amphibians are found in great abundance to engage the attention of those who would study the life of the area.

The Smoky Mountains are said to be the center of dispersal of some of the animals of the eastern United States, and it is especially interesting to scientists that on the tops of these mountains are found forms which are survivals of an ancient fauna which once covered the eastern part of the continent.

This expedition was made possible by the generosity of Dr. Frank J. Psota, Honorary Curator of Entomology, who financed the work. The survey is being conducted by E. V. Komarek of the Academy staff, who reports the work to date as being very satisfactory, and that many worth while specimens have been secured for the Academy's collections.

The field work of Mr. Komarek and his brother, R. V. Komarek, is being greatly facilitated by various residents and officials of that area, and the Academy is especially grateful to Messrs. Charles Dunn and Ennis Owenby, Rangers of the Smoky Mountain National Park, for their co-operation in promoting the work, and to Dr. Psota, without whose helpful interest the work could not have been undertaken at this time.

THE CHICAGO ENTOMOLOGICAL SOCIETY

The Chicago Entomological Society has been meeting regularly at the Academy on the third Sunday of every month, assembling at about 2:30 P. M. in the library. Discussions, informally, of various groups of butterflies or moths have formed the topic of meetings and will be continued regularly until May. Field meetings will be held during June, July, and August and indoor sessions resumed in September. Work on a list of local lepidoptera is progressing. Visitors are welcome to attend the meetings and take part in discussions. The members of the Society will gladly assist in identifying insects of all orders. Additional members are needed. Alex K. Wyatt is secretary and may be addressed at 6116 Forest Glenn Avenue, Chicago.



NOTES FROM

The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

THE AUDUBON ANNUAL MEETING

The annual meeting of the Society will be held in the Academy lecture hall at 8:00 P. M., Tuesday, April 19. The lecture will be given by Mr. Walter W. Bennett, of Sioux City, Iowa, under the title "Siyo" or "Wild Life in the Sand Hills," and will be illustrated with several reels of excellent motion film. Mr. Bennett is an authority on the birds of the sand hill region, an expert photographer, and lecturer. Members of the Academy and the Chicago Ornithological Society and their friends are invited to join with the Audubon Society in making the annual meeting a great success. It is planned that as many as possible meet at the Academy in the late afternoon, go over the exhibits and study collections, and have a good time talking the out-of-doors. It is felt that there are many people in Chicago who would like to become associated with the Society and get acquainted with others interested in birds, so this before-lecture gathering has been suggested. The group will go to the Clayton Restaurant, in the hotel across from the Academy for dinner. (Good meals for fifty and seventy-five cents). We hope to fill the lecture hall for Mr. Bennett's talk, so bring your friends.

THE MCGINNIS SLOUGH

Dr. R. M. Strong

Twenty years ago, Chicago was still unusually favored in the amount of country available near by for nature study or outing. There was the incomparable dune region, and nearer to town, vast areas of unfenced wet meadows and marsh. The marshes and wet meadows had a rich bird population, and the botanical attractions were splendid. Teachers of biological subjects in the public schools, as well as in the colleges and universities, had wonderful advantages for field work with their classes. Many thousands of people not especially interested in natural science got pleasure and health from walks or drives in these regions.

The dune country is rapidly passing for the public except for the Indiana Dune State Park, and the marsh country has been largely drained. The last marsh area of any consequence that has any chance of preservation is the McGinnis slough at Orland. This has an area of over one square mile that is exceptionally well located. It is easily accessible for Chicago people by excellent highways and by the Wabash, 23 miles from Polk Street Station.

Though so easily reached, it is provided with considerable seclusion, so important for a bird sanctuary, by low hills and forest trees. Only a small portion is in sight from much travelled roads.

The McGinnis slough is an exceptionally large flood plain of a small stream. It lies about one-half mile north of 143rd Street and west of 96th Avenue, and it is about three miles southwest of the Palos Park region. A small southeastern portion can be seen from 96th Avenue near its junction with the Southwest Highway. A much more beautiful view can be obtained by going west on 143rd Street about one mile from the termination of the Southwest Highway in Orland to a gravel road going north [Wolf Road]. This ends about one-half mile in a section of 139th Street which is taken going east, i. e. to the right, and ending in about one fourth mile. This view from the west is really lovely, and most of the slough is in sight here. One may approach on foot from any direction.

In the marsh vegetation of the McGinnis slough, and in the adjacent meadows, various species of water birds breed in considerable numbers in spite of negligible policing. A colony of black-crowned night herons has occupied one of the patches of woods facing the water, in recent years. At no time, except during the winter and the hunting season, can one fail to find a fine variety and number of water birds here. There are large numbers of crab apple trees on the hills to the south.

Until the past year or so, there were no large areas of water in the McGinnis slough. The small stream which meandered through it has been dammed as it passes through a culvert beneath one of the highways leading into Orland, adding greatly to the total area, and especially to the amount of open water. Certain interests would like to increase the amount of damming in order to have a lake for

boating and swimming, though such facilities are provided for at Maple Lake in the Forest Preserve only a few miles away.

Raising the level of the water beyond the point existing this past summer would increase the amount of open water at the expense of the marsh area. There is very little lowland not now covered with water. The marsh would be converted into an open lake with small fringes of marsh. Opening this region to boating and swimming would mean the replacement of ducks, herons, and bitterns by hot-dog stands, merry-go-rounds, and picnickers who are already well provided for in Forest Preserve sections not far away.

Most of the McGinnis slough belongs to the Forest Preserve. As soon as a small strip on the north border can be acquired, all hunting can be prohibited. Such a step would of course make the place still more popular with the birds which are finding suitable breeding places becoming scarce.

IN THE NAME OF CONSERVATION!

A recent news clipping in one of the local Chicago papers proclaimed to the world "Marsh to be Made a Bird Reserve," and then told how certain "conservationists," as mentioned by Dr. Strong in the above article, are planning to have McGinnis Slough, one of the few remaining marshes in this area, flooded by building a dam. This plan was submitted to the members of the Conservation Council, and they unanimously resolved that the water level of the slough should be kept at its present level, as flooding the area would ruin it as a breeding place for marsh nesting species. It is unfortunate that groups of people, desiring boating, fishing or bathing facilities, should choose one of the finest breeding grounds of our marsh birds, and plan to gain their ends under the guise of conservation. Our marsh areas have been drained, our forests cut, mammals are being "controlled" by government hunters, and our birds of prey killed in the "interests of conservation," until nature lovers are becoming alarmed and discouraged.

On Wednesday, March 16, the Commissioners of the Cook County Forest Preserves held an open meeting to discuss the subject, and all parties interested were invited to submit their views. It was soon evident that a real estate project was being attempted in the name of conservation. There certainly is nothing wrong in a community attempting to gain recreational areas, but to do so under false pretenses is another thing. When men pose as conservationists and deliberately tell a group of officials that they are trying to create a fine lake which would attract thousands of visitors annually, and in the next breath say they are doing so in the interest of wild life conservation, they seem to hold little respect for the intelligence of the County Commissioners.

The first speaker for the recreational group said that all birds nested on the shores and in the woods, and that none nested in the marsh, which is surprising news, and the next one gave us the information that thousands of visitors would

crowd the seven-and-one-half-mile shore line. It is evident what would happen to the birds nesting on the shores, if the first speaker was correct.

It is strange that the barefoot boy, with pole over his shoulder and dog at heels, is usually called in when an attempt is being made to "put something over" in the name of conservation. In two years' time, the shores would be tramped flat, the birds would be gone, and the barefoot boy would have to dodge automobiles and watch out for tin cans and broken pop bottles. There are probably more barefoot boys visiting McGinnis slough now than would be the case if it were opened as a picnic ground.

All the organizations in Cook County interested in conservation, are united in a protest against spoiling one of the few remaining sanctuaries for marsh dwelling animals.

THE LAST HEATH HEN

An account of the last heath hen appeared in the Annual Bulletin of the Society. Ornithologists, bird lovers, and sportsmen will be interested to know that the last heath hen has appeared again from the seclusion of the scrub oaks of Martha's Vineyard Island, Massachusetts. It has been reported by Warden E. Spofford of the Division of Fisheries and Game, that the bird was seen by James Green and others at 8 A. M., February 9 and subsequently at the Green farm, near West Tisbury. It has been lost to the world since May 9, 1931, nine months, a time so long that it was feared that the last bird had vanished, and the species was finally extinct.

It is extraordinary that this bird continues to live for such a long time, subject as it is to many enemies and disease, after all of its companions have disappeared. Since December 8, 1928, there has been but this one bird. There have been no authentic reports of young heath hens since 1923, hence this bird, a male, is at least nine years old and probably much older.

The bird was trapped by Dr. Alfred O. Gross, of Bowdoin College, and Thornton W. Burgess of Springfield, Massachusetts, on April 1, 1931, who placed two numbered bands, one on each leg for positive identification.

Alfred O. Gross

THE BOHEMIAN WAXWING

The past season has been an unusual one, and the mild weather has encouraged many species of birds to remain with us. Robins, meadowlarks, flickers, blackbirds, and many others have been reported from all sections. Even a brown thrasher was recorded in February. It seems strange then, when so many birds remained north of their usual wintering ground, to have an invasion of Bohemian waxwings from the north. Flocks of these beautiful creatures have been seen in Chicago, the suburbs, and nearby towns during the past six weeks. The majority of the members of this society have probably made observations, and as this is an unusual invasion, it will be of value if each member will send in an account of the numbers recorded, the date, and place.

Program of Activities

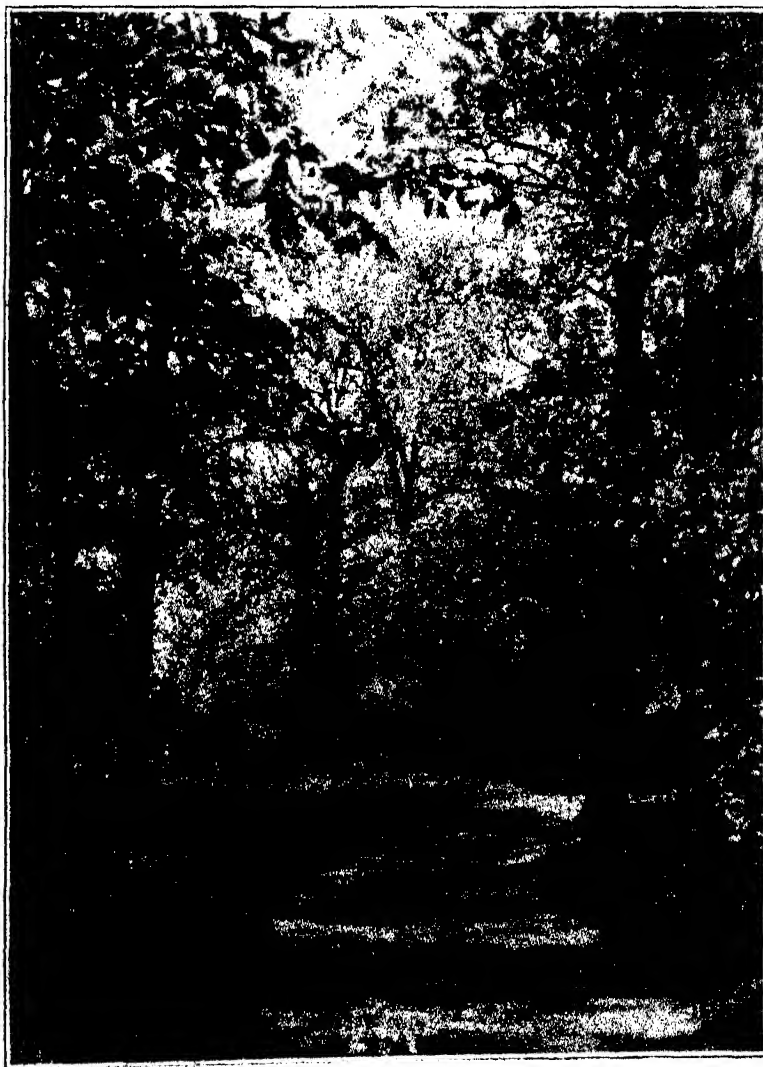
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Photograph by F. R. Dickinson

THE HIKING TRAIL

A footpath winding through the Forest Preserves entices the nature lover far afield. It extends from the northern to the southern border of the preserves and passes near the Trailside Museum.

The Chicago Academy of Sciences

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THE TRAILSIDE MUSEUM OF NATURAL HISTORY

New ideas, when they are obviously good, sell themselves to the public. A new idea in natural history museums has been taking hold in the United States during recent years, and bids to grow even more rapidly in the future. One of its latest expressions is the Trailside Museum of Natural History, started by the Board of Forest Preserve Commissioners of Cook County at the instance of its President, Mr. Emmet Whealan, with the cooperation of the Chicago Academy of Sciences. The former headquarters of the Forest Preserve Commission, at Thatcher Avenue and West Chicago Avenue, in River Forest, now houses an exhibit of the various small creatures which live within the Chicago Area. Unless all signs fail, these furred, finned, and feathered citizens of Cook County will receive thousands of interested callers; and a large proportion of the callers will feel that the Forest Preserve has again proved its value to Chicago. The museum is under the supervision of the officers of the Academy, and a member of the staff, Miss Mary Cooper, is in charge.

The basic purpose of this project is to provide in a simple and informal way, for the many men, women, and children who would like to know more than they do about the wild life, both plant and animal, which is still fairly abundant—more so than most people realize—close to our big city. Somewhere inside most of us, perhaps overlaid by the distractions of modern life, there is a real interest and enjoyment in learning about nature's way of doing things, and the best way to get a start is by observation rather than by book work. One object of the Trailside Museum is to add to the pleasure of the Forest Preserve visitors by showing them what to observe, and the meaning of what they see. Incidentally, the experience of similar institutions has shown that this stimulus to observation has a very desirable by-product: people who learn to observe, cease to destroy. At Bear Mountain Park, on the Hudson River, where a museum and nature trail are conducted under the guidance of the American Museum of Natural History, this fact was emphatically illustrated. Before the museum was opened truck-loads of wild flowers, tree branches, and other trophies were taken from people leaving the park. Since it began to operate, vandalism of this kind has practically disappeared. When you have learned to think of wild life as having value and meaning, you want to let someone else share your pleasure in it.

Needless to say, the visitor to the new Trailside Museum should not expect to find anything elaborate, indeed the aim is to keep it as simple and informal as possible, to make it a project in which the public can share and to which it can contribute. The exhibits include mounted birds, both resident and migratory, seen in this region; skins of small mammals still more or less common in the Forest Preserves; aquariums containing local fish and amphibians; cages for small live animals, including reptiles; sample equipment for collecting and mounting insects and botanical specimens, with instructions for its use; charts with colored illustrations of common birds, insects, and plants; an observation bee-hive and ant nest; and microscopes through which visitors can get a glimpse at curious objects too small for the unaided eye.

The superintendent of the Forest Preserve District, Mr. Charles G. Sauers, has taken a lively interest in the undertaking from its beginning, and is hopeful that it may prove sufficiently popular to warrant similar museums in other parts of the Preserves adjacent to the "hiking" trail which will ultimately extend from one end of them to the other. With old buildings already available, and the material for the exhibits practically all obtainable within the area, the cost of such a development would be negligible and its recreational possibilities very great.

One feature which may be introduced gradually is the making of a "nature trail" through the forest which stands immediately west of the building and surrounds a natural pond. If the necessary help is available, labels will be used to call attention to objects of permanent or temporary interest, so that passers-by can learn the names and characteristics of native trees and shrubs and facts about

flowers, birds, insects, and mammals which may be observed. On such a trail question cards, presenting simple problems about plant and animal life, might be introduced, the answers to the questions being accessible at the museum building. Another possibility is the maintenance, perhaps under the guidance of a local Boy Scout organization, of a workshop in which young people may learn some of the many interesting ways of using the out-of-doors for sane and pleasurable recreation. At similar museums much interest has been shown in the making of leaf and spore prints, and in the preparation of various kinds of collections.

The pond referred to above is a natural back-water coming in from the Des-plaines River at periods of high water and shut off from it when the river is low. At present, subject to overflow as it is, the water is not always as clear as might be desired, and the vegetation along the banks does not have a fair chance to become well established. If some means can be found to shut out the river in flood time, and to compensate for evaporation during the summer, this pond can be transformed into a spot of much interest and beauty. A high bank runs along one side of it, affording a good view of most of the surface area. Deepening the central part, planting the shoals with aquatic vegetation, allowing nature to reclaim the margin, and stocking the water with a few varieties of native fish and amphibians would establish a very attractive water garden.

Just above the pond, between it and the museum building, is a level quarter acre of land on which stands a frame building about seventy-five feet in length. As a future possibility, this would serve for a small auditorium in which motion pictures and lantern slide talks on the natural resources of the Forest Preserves could be given. One end of this building could be set apart for a workshop. In front of it is a space, well shaded with large trees, which would be suitable for outdoor pens in which small mammals of the region could be exhibited.

The Chicago Academy of Sciences has gladly contributed time and material for the installation of the exhibits, and believes firmly in the value of the idea. The incalculable value of a wild forest area close to a large city must be apparent to anyone who visits the Preserves and sees how fully and freely they are being enjoyed by individuals who have little or no other chance to get away from pavements. To the effective development of this immense playground the nature trail and museum will add the one thing needed, an opportunity to use it not merely as a place for picnics and outdoor recreation, but as a means to a better understanding of its natural beauty, with the added enjoyment which such an understanding brings. There is nothing "highbrow" about the project, and no desire to force instruction on any one who does not want or need it. On the contrary, it is hoped that the visitors will make the institution their own, bringing to it whatever questions it can answer, adding to its collections, and suggesting new activities. We believe that Mr. Whealan and the County Board are amply justified in their belief that the Trailside Museum will fill a real need.

F. R. D.

THE PLANT LIFE OF THE FOREST PRESERVES

To one not familiar with what the Chicago Area offers in the way of wild flowers, shrubs, and trees, a first visit to the section of the Forest Preserves adjacent to the new Trailside Museum is a revelation, particularly if it happens to be made in springtime when the early flowers are at their best. Incredible as it seems, this stretch of woodland, within half an hour's ride from the center of Chicago, contains extensive tracts which to casual observation are as unharmed by man as they were in pioneer times. Despite the throngs which flock to every part of the preserves for rest and recreation, the County Commissioners have managed, without setting up unreasonable restrictions, to persuade most of the public that the best way to enjoy the out-of-doors is to keep it as nature intended it to be. The open playgrounds and field houses absorb much of the crowd and provide it with means for exercise and free pleasure; but close at hand, for the many who prefer quieter pursuits, are the woods with all they contain for the nature lover and student.

The general region is very rich in plant life. Among the commonest trees in the bottom lands are the river willow, peach-leaved willow, cottonwood, walnut, bitternut hickory, American elm, slippery elm, hackberry, wild crab, hawthorn, black cherry, silver maple, basswood, white ash, and black ash. On somewhat higher ground the following are characteristic: shagbark hickory, hop hornbeam, white oak, burr oak, red oak, Hill's oak, black oak, and hard maple. Somewhat less common trees to be found here are the aspen, butternut, water beech, mulberry, serviceberry, coffee tree, red maple, blue ash, and red ash. The Thornton-Chicago Heights area is especially characterized by certain trees rare elsewhere, namely, the pin oak, sassafras, sycamore, sourgum, and buckeye. The buckeye area at Chicago Heights is unique, being the only known place where this tree occurs for many miles. North of Desplaines is an interesting area of cork elm. On Mt. Forest Island occurs the chestnut oak, the shingle oak, and the pawpaw. There is only one evergreen tree in the Forest Preserves, and that is rather rare—the red cedar.

Some of the commonest shrubs are the sumach, elderberry, gooseberry, rose, and hazel. The most important vines are the grape, poison ivy, Virginia creeper, green brier, bittersweet, and honeysuckle. There are great numbers of wild flowers especially in the river bottoms. There may be found Jack-in-the-pulpit, various violets, trillium, iris, spring beauty, various buttercups, phlox, shooting star, lupine (especially at Thornton), hepatica, May apple, and many others.

In addition to the enjoyment which nearly everyone feels in looking at the wild flowers, an increasing number of people, young and old, are using the preserve for purposes of plant study. One of the usual sights on a Saturday or Sunday is a group of flower enthusiasts, with manuals in their hands, identifying the various species met with during their rambles in forest and field. Activities of this kind

will be greatly promoted by the new hiking trail, which according to present plans, will extend from one end of the county to the other in a general north and south direction. Its primary purpose is to link more closely the different areas and enable walkers to get, on successive week ends, a comprehensive idea of the entire area—now practically continuous—controlled by the Commissioners. In serving this purpose, it will also help would-be botanists to gain a clearer idea as to the characteristics of the several sections.

A recent suggestion containing possibilities of interest is that a small area—one or two acres—close to the new Trailside Museum, be gradually turned into a miniature botanical garden into which most of the flowers and shrubs of the Chicago Area, and some of the trees, could be transplanted and marked with appropriate labels. The cost of such a project would be negligible, as the necessary materials, labor, and supervision are already available. It would supply in compact form, a place where more could be learned in an hour than in a whole day of aimless wandering. It would seem that something of this kind should be done with the intelligent and progressive supervision of Cook County's playground which is evident in the developments already completed. H. C. C.

ACCESSIONS

The Academy is grateful to the donors of the following specimens received during the past months. Directions for sending live material, collecting, and preserving specimens will be sent to those desiring to collect for the museum.

George A. Brennan—1 Gila monster	Robert Lowden— 7 reptiles and
Mrs. Chas. Carlson— 3 specimens of ore	amphibians
George Dorpert—1 scorpion	Karl Plath—1 green heron
W. H. Edwards—1 flying squirrel	Lillian Schlesinger and Ivy Stanek—
E. R. Ford—7 eggs	4 snakes
Walter P. Hill—4 live reptiles	Walter Schlesinger—2 tree frogs
Dr. A. B. Lichtenberg—1 milk snake	J. R. Snyder—5 bird skins
George Litman— 16 snakes, 1 necturus	Alfred C. Weed—1 Kirtland's Watersnake
Donald Locke— 1 coyote	Roland Wenk—12 snakes

THE HERPETOLOGICAL COLLECTION

Many friends of the Academy have cooperated with the staff this past spring in building up the collection of reptiles and amphibians. Among those deserving special mention are Mr. Walter P. Hill of Rockledge, Florida, members of Dr. Allee's Field Ecology Classes of the University of Chicago, and James J. Mooney. Specimens, especially from Illinois, are greatly desired for a future comprehensive account of the Herpetology of Illinois and for the general enlarging of the collection. Methods of collecting and shipping will be sent to anyone interested.

THE REPTILES AND AMPHIBIANS OF THE FOREST PRESERVES

The average visitor to the Forest Preserves notices few of the lower vertebrates —the salamanders, frogs, toads, and tree frogs, the lizards, snakes, and turtles. These animals, held in fear by many people, are really quite harmless—and interesting. Spring is an ideal time to observe these animals; you may see two varieties of garter snakes, a green snake, fox snake, or the hog-nosed snake (sometimes called spreading adder, and very inoffensive, although it puts on a bluff by hissing, and spreading like a cobra). When your interest is aroused, and you kick over some logs in your path, you may find the tiger and spotted salamander, the former having yellowish blotches over the entire body, the latter having yellow spots arranged in two more or less definite rows on the back. You may be lucky enough to find the rare four-toed salamander, a small dark one with a china-white belly speckled with black. Some of the smaller snakes may also be found under logs, a small, brown one (De Kay's snake), and others, perhaps quite rare.

The painted turtle will be seen sunning itself on a log in the streams; the musk, spotted, snapping, and Blanding's turtles may also be found there. When you walk along a pond or marsh, frogs will hop into the water on your approach, and if you are quick, you may catch some — the large, spotted leopard frog, or a small species about half an inch long with dark stripes down its back, known as the swamp tree frog; or perhaps you will get spring peepers with X-like marks on their backs, and the wood frogs with black masks over their eyes like bandits. Night is the best time to hunt frogs. Equipped with a flashlight, one follows the voices in the marsh — the sharp clear whistle of the spring peeper, the chicken-like chuckle of the wood frog, and many others harder to describe. After a time you will be able to identify the frogs by voice alone. Walking through the pond or swamp shining the light into the water, you will see many invertebrates swimming, or, crawling along the bottom, and perhaps a newt, a small salamander with red spots on the back and a yellow belly speckled with black; other salamanders may also be found in abundance during the breeding season. When fishing along the shore of the lake or a river you may catch a mud puppy, a large, slimy salamander with red external gills; perhaps a water snake is lying near you, a brownish-red fellow. It is not poisonous, and like other snakes of the Forest Preserves, should not be killed, for most of them are distinctly beneficial, and all, except the massasauga, are harmless.

Unfortunately, the reptile fauna near Chicago is being exterminated by ignorance and progress; an exaggerated sense of the harmfulness of snakes and any other animals that crawl, and extensive building and agricultural operations have tended to decimate part of our interesting fauna. None of our reptiles, with the exception of the above-mentioned massasauga rattler, whose bite, even though probably not fatal to man, may cause considerable pain, and the snapping turtle, which feeds on water-nesting birds and fish, is detrimental. About half of the

hundred species of reptiles and amphibians native to Illinois may be found in the Chicago area. Below is a list of our local forms:

Salamanders

Mud Puppy
Common Newt
Jefferson's Salamander
Spotted Salamander
Tiger Salamander
Four-toed Salamander
Red-backed Salamander

Necturus maculosus
Triturus viridescens
Ambystoma jeffersonianum
Ambystoma maculatum
Ambystoma tigrinum
Hemidactylium scutatum
Plethodon cinereus

Frogs and Toads

Common Toad
Fowler's Toad
Cricket Frog
Swamp Tree Frog
Spring Peeper
Common Tree Frog
Wood Frog
Bullfrog
Green Frog
Pickerel Frog
Leopard Frog

Bufo americanus
Bufo fowleri
Acris gryllus
Pseudacris triseriatus
Hyla crucifer
Hyla versicolor
Rana cantabrigensis
Rana calesbeiana
Rana clamitans
Rana palustris
Rana pipiens

Lizards

"Glass Snake"
Skink

Ophisaurus ventralis
Eumeces fasciatus

Snakes

Ring-necked Snake
Hog-nosed Snake
Green Snake
Blue Racer
Fox Snake
Bull Snake
Milk Snake
Graham's Watersnake
Kirtland's Watersnake
Queen Snake
Watersnake
DeKay's Snake
Red-bellied Snake
Garter Snake
Ribbon Snake
Garter Snake
Massasauga

Diadophis punctatus
Heterodon contortrix
Liopeltis vernalis
Coluber constrictor flaviventris
Elaphe vulpina
Eituophis sayi sayi
Lampropeltis triangulum triangulum
Natrix grahamii
Natrix kirtlandii
Natrix septemvittata
Natrix sipedon sipedon
Storeria dekayi
Storeria occipito-maculata
Thamnophis radix
Thamnophis sauritus
Thamnophis sirtalis
Sistrurus catenatus catenatus

Turtles

Musk Turtle
Snapping Turtle
Spotted Turtle
Blanding's Turtle
Painted Turtle
Soft-shelled Turtle

Sternotherus odoratus
Chelydra serpentina
Clemmys guata
Emys blandingii
Chrysemys picta bellii X *marginata*
Amyda spinifera

W. L. N.



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

BIRD LIFE OF THE FOREST PRESERVES

It is nearly fifty miles from the Deer Grove Preserve, in the northwestern part of Cook County, to the Sauk Trail Preserve in the southeastern part of the county. Hence there is the possibility, always, of encountering resident species of birds at one end of our territory, which are normally of a more northern range, and, at the other end, some which usually are of a more southern range. For example, the tufted titmouse, commoner in the southern part of the state, may be found along the Desplaines River and Salt Creek, in the lower half of the county, while it is rarely seen in the northern half. On the other hand, the veery is occasionally found nesting in the northern part but not in the southern.

For the most part the preserves are located along the Desplaines River or its tributaries, which are in the drainage area of the Mississippi, or along the Chicago and Calumet Rivers and their tributaries, which are in the St. Lawrence drainage area. This makes for variety in the bird life of the region because birds and other animals tend to migrate along waterways and hence, in time, to extend their ranges.

There are between 250 and 300 varieties of birds (species and sub-species) to be met with in what is roughly known as the Chicago Region. As some of the

preserves include a considerable area of prairie and marsh land, and as some contain small lakes, nearly all these varieties may be seen at some time within these limits. A few species of water birds, such as Holboell's grebe, piping plover, and American golden-eye, are not likely to be observed except on Lake Michigan.

It must be remembered that, to some extent, the advantages of our great Forest Preserve system and the excellent roads which make its limits so accessible, are offset, from the point of view of the most favorable conditions for birds, by the increased number of people who now find their way into this domain and who, be they ever so careful (alas, that many do not care at all), spoil nesting sites and feeding cover. Then, too, there is often (again from the point of view of the birds' well-being) what seems to be an unnecessary tidiness in the burning of dead leaves and the cutting and clearing away of all dead growth. Dead and decaying stubs offer nesting sites for chickadees, nuthatches, woodpeckers, crested flycatchers, and other birds. Fallen dry branches form a partial protection for nesting thrashers, towhees, and woodcock.

Much damage is done by the practice of driving motor cars off the road, wherever the ground is solid enough to bear them, and into meadows, brushland, brushy wood margins, and similar situations particularly favorable as bird cover. Driving off the road, except where there are established parking spaces, should be forbidden, but the prohibition would be useless unless policing were constant and adequate.

But now to Thatcher's Woods where yet may be heard the song of the cardinal and the whistle of the tufted titmouse, where the thrasher sits on the thorn-tree and in summer the rain-crow pretends to weather wisdom. Near here Dr. Eifrig has found evidence of the breeding of Bachman's sparrow, a bird not usually found in the northern part of Illinois. Here, too, the little screech owl broods in a hollow stub, if he can find one, and at night his melodious and quite unterrifying quaver pleases the ear of those who like to know that they yet have wood creatures for neighbors. On this tract is the Trailside Museum, the first of a number of such places planned for the Forest District, where, through the co-operation of the Chicago Academy of Sciences, a building will house both living and mounted specimens of the common biological forms of our region.

Again let us spend a few hours in Humphrey Woods, in the midst of which lies the much-discussed McGinnis Slough. It is late April and, as we enter the grove, we hear at once the thrasher's loud spirited song and the soft warble of the bluebird. We move along the edge of the marsh and now and again "jump" a Jacksnipe. When one jumps, three or four more will follow separately at brief intervals. Now a bittern gets up heavily and six blue-winged teal go by. For a few minutes nothing more is seen save a skulking swamp sparrow. We go on a few paces and open water comes into view. Sporting on its surface and diving into its depths are hundreds and hundreds of coots, grebes, and ducks. The coots

will nest there, among the cat-tails and tules; the little pied-billed grebe will nest there, and in the adjacent uncultivated open places the teal will lay its eggs and surround them with a thick, soft mat of down. All this of course if the land is left as it is. Crossing now through the woods, a cardinal's bright coat is glimpsed in the bushes, towhees fly up with a rustle and the first white-throats are met. Out to the edge of the marsh again to frighten a king rail and follow him into the dead flags among which he drops. He does not rise now but makes his way unseen into deeper security. Then a great blue heron rises, having a sort of majesty despite his slow and awkward launching. Just as we leave the marsh we put to flight a flock of yellow-legs, which, reluctant to leave their rich feeding ground, wheel and light again a few paces off. When the grass is bright green at the edge of the pools and a soft light comes through the pink buds of the oaks and a warm wind comes off the fields, there is lacking only the fluting of the yellow-legs. Presently, if luck holds, that comes, too.

In early May during the warbler migration in a recent year we saw twenty-five species of this fascinating and interesting family in a single day. Of several species only one or two individuals were seen, but of others, notably the magnolia and Wilson's warbler, there was great abundance. This satisfying encounter with a "wave" of warblers took place in Morse Woods near Wheeling. It is likely that on the same day one would have been equally fortunate in the Riverside or LaGrange Woods.

In the Argonne Forest is Maple Lake where ducks and grebes, and, occasionally, a loon may be seen in migration. There is a small marsh at the edge of the preserve where coots, grebes, and blue-winged teal are seen and where, doubtless, they nest. Here, formerly, before the lake was created, the chickadee fashioned a hollow in a decayed stub, the whippoorwill called from the hillside, the woodcock performed his nuptial flight, and the hairy woodpecker called with sharp and vigorous cry. It is likely that these species may still be found there if, in the quieter and less frequented spaces conditions have been left as they were.

The Palos Hills region is another haunt of the whippoorwill. Here also an occasional cut bank provides a place for the kingfisher to form his burrow. Here and there one of these, no longer used by the original miner, may be occupied by a pair of nesting rough-winged swallows. Although other records of the probable breeding of the Carolina wren in our region have been published, the only definite record of the nest of this species in the Chicago area is from the Palos District.

Distinct memories of other days in the Forest Preserves, or rather in the fields and woods they now occupy, are revived when, in rare instances, a place is come upon which is little changed. In the Mascouten Reserve, through which flows a tributary of the Chicago River, there is a tangle of buttonbush, which, growing in the lowlands, forms an island thicket when the water is high. Seen thus, this thicket is, in imagination, still the home of five or six pairs of green

herons which, in that former time, found the protection of interlaced, rough branches and the surrounding water suitable to the safe rearing of their broods. Green herons, in this region at least, are not usually gregarious in their nesting habits. A pair or two may have nests not far apart but they do not gather in numbers as do the black-crowned night herons and the great blue herons.

What are the birds of the Forest Preserve most likely to be seen? Of course they would be (1) those remaining longest in the region and, (2) those occurring in summer when the preserves are most in use. Hence a list of such birds would be a list of the summer residents which are most numerous. Let us make such a list confining it to twenty-five species and see if it approximates the experience of other "bird watchers" in the preserves.

Mourning dove, yellow-billed cuckoo, flicker, red-headed woodpecker, downy woodpecker, kingbird, prairie horned lark, blue jay, crow, catbird, brown thrasher, robin, red-eyed vireo, yellow warbler, meadowlark, red-wing, bronzed grackle, cowbird, cardinal, indigo bunting, goldfinch, towhee, vesper sparrow, field sparrow, and song sparrow. The species are not named here in order of their abundance, but in order of their classification.

On a morning in May or June scarcely one of our preserves, with its bordering fields and marshes, would fail to yield such a list. And if there were no more your ardent seeker of bird society would own himself satisfied.

Edward R. Ford

McGINNIS SLOUGH

Members of the various nature organizations have been aroused during the past spring by the efforts of certain individuals to have this natural sanctuary of wild life turned into a public playground, and the officers of the Illinois Audubon Society have taken an active part in defeating the move. Members of the Society will be glad to know of the following communication from Captain Charles G. Sauers, Superintendent:

"The Board of Forest Preserve Commissioners concurred in the recommendation of our Advisory Committee which would leave the McGinnis Slough in its present condition with not more than one foot increase in the water level.

"A further recommendation was that sufficient acreage be purchased to bring this to a good natural boundary, and when funds permit, that the large slough be fenced."

So this wonderful sanctuary, one of the last of the region, is to be saved as a breeding place for wild fowl. Several members of the Kennicott Club visited the area during the third week in May and they reported hundreds of nesting marsh birds, including blue-winged teal, grebes, coots, gallinules, rails, and perching birds.

Program of Activities

of

The Chicago Academy of Sciences

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ATLANTIC PUFFIN

Fratercula arctica arctica

The solemn puffins are hardy creatures inhabiting the North Atlantic, nesting from the northern coast of Maine to southern Greenland, and from Norway and the British Isles to Portugal. They are droll fellows, and owing to their tameness, have been greatly persecuted by man. Large colonies were found in the Canadian bird sanctuaries by the recent Academy field trip and the above photograph is an enlargement from motion film made on the expedition.

The Chicago Academy of Sciences

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SERVICE

The ground for our building was broken forty years ago, and the home of the Academy was completed one year later. Since that time, approximately twelve million people have visited the exhibition halls, and have gained some knowledge of the animal and plant life of the Chicago area. Forty years is a long time, and yet, Matthew Laffin and his associates planned wisely, for the architecture of the building is of the type that never grows old - and so, we may expect the Academy to go on influencing the people of Chicago in their interest in nature and conservation. After all, conservation means more than saving our birds, mammals, and plants. Conservation means the protection of all our resources. If we are to have good government, we must be conservative. Consequently, we feel that the donors of the Academy endowment funds, the officers who have given their time so liberally in the years that have passed, and the members who have so loyally supported the Academy, have rendered a service to the people of their state.

AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during the autumn of 1932 in the Assembly Hall, Sundays at 3:00 P. M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

October 23—Zion National Park and Grand Canyon Dr. C. O. Schneider

Dr. Schneider is well known to the audiences at the Academy lectures, as he has given us in the past remarkable autochrome pictures. The pictures this year are highly attractive.

Illustrated

October 30—The Museum Comes to Life Dr. Carey Croneis

Dr. Croneis is Professor of Paleontology at the University of Chicago, and came to the University upon the death of Dr. Weller. He has made a special study of the new Rosenwald Museum in Jackson Park, and is able to give us an interesting account of its many remarkable features.

Illustrated

November 6—Reliving the Past Mr. Alonzo Pond

Mr. Pond is an archeologist and explorer, and has made many excursions to get light on the past. He accompanied Roy Chapman Andrews on one of his trips to the Gobi Desert. Mr. Pond was leader of the Logan Museum excursion to Algeria.

Illustrated with Slides and Motion Pictures

November 13—Glimpses of Greece Dr. George K. K. Link

Dr. Link is Professor of Plant Pathology at the University of Chicago, and is well known to Academy audiences, having given lectures on the Orient and in his field of pathology.

Illustrated

November 20—In the Cellars of the World Mr. Russell T. Neville

Mr. Neville has appeared on the Academy program several times, and some of his lectures have had the title here announced. However, his lecture this year is entirely different, dealing with the Carlsbad Cavern in New Mexico and the Ozark Mountains, Missouri.

Illustrated

November 27—Art of the Old Stone Age Dr. Carroll L. Fenton

Professor Fenton is an explorer in various fields, having worked problems in geology and archeology. He lectured at the Academy last year and all who were present will want to hear him again.

Illustrated

LABRADOR

Ten thousand feet of motion film were added to the film library as a result of the Academy's field trip to the Gulf of St. Lawrence and the Canadian Labrador coast this past season. Dr. Harrison F. Lewis, chief federal migratory bird officer of Ontario and Quebec, works this region each season, and he invited a representative of the Academy to accompany him on his new launch, the *Alca*, in order that the wonderful bird colonies might be recorded on motion film.

Customs difficulties were eliminated by Dr. Nathan S. Davis, Secretary of the Academy. He asked his former classmate, Mr. Hanford McNider, U. S. Minister to Canada, to present our case to the proper officials, and after some delay, the heavy duty was waived on all our equipment.

Mr. A. M. Bailey joined Dr. D. A. Dery, of the Provancher Natural History Society, at Trois Pistoles, Quebec, and they photographed the wonderful eider duck sanctuaries on Les Razades, two small rocky islets which are owned by the society. As these colonies are under the constant protection of a warden during the breeding season, thousands of young eiders are reared. The society kindly placed their warden and his boat at our disposal, so unusual opportunities were presented for photographic work.

The *S. S. Sable* was taken from Rimouski, Quebec, on July 29, by Mr. Bailey, and five days later he arrived at Harrington Harbor on the south shore of the Labrador Peninsula. Photographic work was carried on on the St. Mary's Island sanctuaries for the next week, headquarters being made with Mr. Fred Osborne and family, who attend the light house. As Mr. Osborne has lived in the region many years, he is thoroughly familiar with the best places to photograph, and with his help it was possible to secure many unusual pictures.

The whole coast region, from the St. Mary's Islands eastward to Blanc Sablon is arctic in character, with the glacial worn rocks clothed with alpine vegetation. Moss covered the wind-swept expanses, while dwarfed trees grew in sheltered ravines. Pipits, horned larks, and white-crowned sparrows were the principal land birds, while sea fowl of many species lived among the boulders, tunnelled in the grassy slopes, or laid their eggs upon exposed shelves of precipitous cliffs.

The Candian Labrador was visited by Audubon one hundred years ago this coming summer. He made many of his most interesting bird paintings on this trip, as well as many observations on the bird life of the region.

Dr. Lewis called for Mr. Bailey at St. Mary's and during the next ten days they followed along Audubon's old trail, visiting and making motion pictures of the places mentioned by Audubon. The finest bird colonies of the Labrador Peninsula are in this region, the majority of which have been set aside as sanctuaries by the Canadian government. No longer are fishermen able to raid the colonies, stealing eggs by the thousands and killing the young, for wardens patrol

the area during the entire nesting season. There has been a noticeable increase in the number of sea birds on the protected islands during the past years, so unusual photographs were secured of the rare European cormorants upon the ledges of Wapitigun Cliffs, of murres, auks, puffins, gannets, eiders, and red-throated loons.

The photographic work along the north shore was concluded at Perroquet Island, the last place visited by Audubon on that coast. It is one of the finest bird colonies of the north, with approximately fifty thousand nesting puffins. The air was filled with swirling birds. Audubon was so impressed that he wrote, "one might have imagined half the puffins in the world had assembled there."

Bonaventure Island, a government bird sanctuary on the south shore of the gulf, was visited after the conclusion of the northern work, and unique photographs were secured along the steep seaward cliffs. The great gannets nest by thousands upon the narrow ledges. Mr. Bailey had photographed on Bonaventure ten years before, and he found the same warden in charge. Mr. Duval aided in lowering the photographic equipment down the cliffs and in setting up the blinds. The birds were so numerous and so tame that two thousand feet of film was made in a day.

The Canadian government has set an example which other countries might well follow. They have made sanctuaries, and they have placed Dr. Lewis and his wardens to see that the laws are enforced. We have many government sanctuaries too, but unfortunately, the majority are not protected.

AT THE TRAILSIDE MUSEUM

The Trailside Museum in the forest preserve at Chicago and Thatcher Avenues, which has been built through the cooperation of the Academy with the Commissioners of the Cook County Forest Preserves, has been open for three months, and its popularity has exceeded our expectations. With exhibits restricted to objects which are found in this region, we have been able to fill the rooms with varied displays in the various branches of natural history. And the museum is certainly popular!

Where else around Chicago can you find so informal a museum? Where else can the casual visitor play with the porcupine, learning for himself that it can't shoot its quills? Or help feed the snakes, if he comes at the right time? Or, even if he's a very small boy, work the microscope up and down, 'til that fly's leg gets in sharp focus?

Trailside Museum's informality, coupled with its concentration on the local material that he has seen and knows a bit about, has made it a paradise for small boys. A survey of the attendance for a two-week period in August shows that on any one day the boys under fourteen made up from $\frac{1}{3}$ to $\frac{1}{2}$ the total number of visitors, or, on all but one day, far more than any other one group.

So as it has grown, the museum has naturally tended to become organized around the small boy. Cases and cages, signs and pictures, have been placed near the eye-level of a twelve-year-old. The directions for operating the microscopes, and the labels describing the exhibits, have been written largely for him. That's only fair, for he has contributed many of the exhibits himself. Alone and by twos and threes he brings in chipmunks, gophers, snakes, frogs, toads, salamanders, butterflies, crickets, katydids, moths, cicadas, birds' nests and spiders. He keeps the place supplied with snake food in the form of worms and small toads. And he comes in throngs every day, and brings his parents, and the parents of his friends.

Thanks to the cooperation of our small boy friends, as well as of many other interested people, the collections grow daily more representative of the life of the Forest Preserves. At present we have on exhibit eighty mounted birds of sixty-three species, twenty-four skins of mammals, four cases of insects, cases for collecting plants and insects, and many charts. Live specimens are our most important exhibits—flying squirrel, fox squirrel, chipmunks, gophers, deer-mice, skunk, and porcupine, among the mammals; screech owls and sparrow hawks; green frogs, leopard frogs, American toads, Fowler's toads, newts, and salamanders; six species of turtles and seven of snakes; sunfish, bullheads, red-bellied dace, shiners, katydids, grasshoppers, cicadas, wasps, and many varieties of caterpillars.

The microscope continues to be a most popular feature. The other day a boy came to us for first aid. He was almost in tears over a bee sting. We extracted the sting. The pain forgotten, the youngster took the sting and raced for the office door. "I want to look at it under the microscope right away," he explained.

Work has been started on the Nature Trail. It will follow the Des Plaines River Trail to a point nearly half a mile north of the Museum, where it will double back and circle the slough. It traverses many types of plant habitats—open woodland, valley bottom, hillside, open field, river bank, marsh, and swamp. Plants from all parts of the Preserves will be concentrated here in their appropriate environments. Properly labelled, it should present a really representative picture of the Forest Preserves as a whole.

A bird banding station has been established, cooperating with the U. S. Biological Survey and the Inland Bird Banding Association.

Many of the casual but not so often seen phenomena of the lives of wild creatures may be observed almost daily at the Museum. A spider spins a web, a wasp crawls out of the cell which held him prisoner as a pupa, a snake sheds its skin, katydids "sing" visibly as well as audibly, chipmunks stuff their pouches, the long tongue of a toad shoots out and captures an earthworm, the flying squirrel stretches sleepily, spreading his parachute-like folds of skin. Outsiders may think Chicago's "wild life" is best seen in a night club. But those who best know our region know that here is found a far happier and more truthful picture.

M. W. C.

MUSEUM ACTIVITIES

Dr. J. R. Ball, the Academy's Honorary Curator of Invertebrate Paleontology, has just returned from an around the world tour that has covered about 28,000 miles. Mrs. Ball accompanied him, but she is remaining at Seattle, Washington, for the winter.

The purpose of the trip was to meet some of the men engaged in geological and paleontological studies elsewhere, to learn something of their methods, to secure mineral, rock, and fossil specimens, and to prosecute studies in several lines of research. His itinerary included the British Isles, France, Germany, Czecho-Slovakia, Austria, Italy, Switzerland, Palestine, Egypt, China, the Philippine Islands, Japan, Hawaii, and some of our western States.

His time was divided between studies in museums, libraries, and in the field under the guidance of local authorities in the particular regions visited. He had opportunity to visit about sixty museums, have conferences with fifty different scholars interested in geological and paleontological subjects, attend three meetings of various scientific societies, and to hear about a dozen lectures given by English, French, Filipino, and American scholars. In his collecting Dr. Ball secured about 1600 specimens of rocks, minerals, and fossils, and also a number of maps, charts and books. Many of the specimens will be placed in the study collection of the Academy museum. They were obtained chiefly in England, Central Europe, the Philippine Islands, and Hawaii.

Michigan

The vicinity of the Huron Mountain Club in northern Michigan, has been a fertile region for photographic work and bird study for many years. Mr. Tappan Gregory, Honorary Curator of Mammals, has made his best flashlight photographs along the beautiful lakes of this area, and he added a few negatives to his collection during the last week in May. Several other members of the Academy and the Kennicott Club joined him, with various objects in view. Mr. Stephen S. Gregory, Jr., continued his work on the birds of the region. Dr. Wilfred H. Osgood and H. Boardman Conover pursued the wary trout, while Tappan Gregory and A. M. Bailey spent the daylight hours trying to photograph the Great Northern Diver. Each lake had its pair of loons and although nests were found, incubation had not started, so the old birds could not be induced to pose for the camera.

One specimen was secured by Dr. Osgood, a baby porcupine a few days old, which is now in the Trailside Museum. This little fellow has delighted thousands of youngsters during the past summer.

Motion pictures for the film library were made along the east shore of Lake Michigan, near Charlevoix, by Mr. F. R. Dickinson. Several thousand feet of negative were exposed, and many unique pictures of the animal and plant life were secured. By means of special equipment, Mr. Dickinson was able to secure large images of insects and other small forms.

Alaska

The field work of the Academy representatives has been carried on at widely separated localities along the northern coast of Alaska. Word has just been received from Mr. Charles Brower, Point Barrow, the northernmost settlement in North America, telling of conditions at his remote station. Some idea of Barrow may be obtained from the following paragraph in Mr. Brower's letter.

"We are hoping for a boat in a few days, but the chances do not seem very good at present (August 22). The wind is southwest, it is blowing hard and snowing to beat the band. The ice pack is in solid, with just a little strip of water close to the beach, while the heavy 'old ice' is grounded on the ridge."

Mr. Brower is returning to the states, and will visit the Academy during the winter.

The eskimo naturalists, Dwight Tevuk and Arthur Nagozruk, have been working at Cape Prince of Wales, westernmost North America, and King Island, a little spot in Bering Sea. An interesting collection has been received from Tevuk, but owing to difficulties of communication, no word has been received from Nagozruk.

Smoky Mountains

A faunal survey of the Smoky Mountains will be carried on by the Academy during the next year, and Mr. E. V. Komarek, his brother, R. V. Komarek, and Mr. James Mooney have been actively at work in Sevier County, Tennessee, during the past three months. They are receiving the cooperation of the National Park officials and the people of the region, so many interesting specimens are being secured for the Academy collections. Mr. Komarek plans to cover as much of the National Park area in his survey as is possible during the next nine months.

Illinois

During the early part of August Walter L. Necker collected reptiles and amphibians in the vicinity of Camp Ki-Shau-Wau, Tonica, Illinois, near Starved Rock, at the invitation of the Du Page Area Council of the Boy Scout Organization. We are especially indebted to Messrs. H. A. Clark, Jack Conley, and Don Locke for courtesies extended to Mr. Necker. Although no unexpected specimens were secured, new locality records for a number of species were obtained.

Work on the herpetology of the Chicago Region has turned up two quite unexpected records through the efforts of some of our correspondents. The two-lined salamander (*Eurycea bislineata bislineata*), has been sent in from Custer Park by Mr. N. Bergendahl; this is the northernmost record for the species, and the only authentic one for Illinois. The second form, the opaque salamander (*Ambystoma opacum*), was collected near Dune Park (Wilson), Indiana. Because of our imperfect knowledge of the reptile and amphibian fauna of Illinois, specimens, especially from the central and southern parts of the state, are much desired for our collections.



NOTES FROM

The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

AUDUBON DINNER ON BIRD DAY, OCTOBER 14

The Society will give a dinner at the Chicago Women's Club on Bird Day, October 14, for members, their friends, and all who are interested in birds and conservation. There will be several of the foremost naturalists of the city on the program, the details of which will be given in the announcement which will be mailed at an early date. Members are urged to send names of friends who might be interested in becoming affiliated with our organization. If we are to accomplish results in an effort to protect wild life, we must have a large membership throughout the state. Plan to attend the dinner, and when your invitation is received, return the reservation cards immediately.

THE UNEXPECTED BLUEBIRDS

The sweet notes of a bluebird. Is it possible? It seems so out of place among all this noise and clatter of moving locomotives and rattling tank cars. Yes, there it is again — that same sweet voice that we are wont to associate with the first arrival of spring, and there are the birds, a pair of them, and wonder of wonders, the female enters the end of an upstanding three-inch pipe on the loading platform, and examination reveals a nest with two eggs and a newly hatched youngster. I was about to head this "The Misplaced Bluebirds," but are bluebirds

ever misplaced? Do we not always welcome them at any place and at any time? I had also thought of calling it "The Unrefined Bluebirds," but bluebirds are always refined even though they do select the midst of a big oil refinery as a nesting site.

We have seen some odd bluebird nesting sites in the past but we do not recall an instance where the chosen site was far removed from a few trees or at least a bit of shrubbery. But here at Wood River, Illinois, these bluebird pioneers have made their home practically in the very center of this immense oil refinery which covers some six hundred odd acres of territory. There is not a tree or a bit of greenery within a half mile of the loading racks, nothing but steel storage tanks and railroad tracks and oil-soaked earth. The very air reeks with the odor of gasoline and other petroleum distillates. In short, this odor of kerosene, gasoline, etc., has the effect of reducing the insect life to a point where one wonders how these bluebirds find their necessary food supply. To be sure, this nesting site is secure from the bluebirds' natural enemies. There are no squirrels or hawks or owls within the confines of the refinery, and I understand that there is a fairly plentiful squirrel population in the country surrounding Wood River, and this may be quite a factor in these bluebirds' selection of such a site.

This bluebird nest is placed about eight feet high, at an elbow joint in a vertical pipe about ten inches from the open pipe top, and the bird enters and leaves at the top. This pipe stands on a loading platform not six feet from where the tank cars are being shifted back and forth all day long and sometimes most of the night. Also, not twenty feet away is a stairway connecting with an overhead bridge where workmen are passing up and down every little while.

I am told that this is the first time bluebirds have been observed about the yards although nighthawks have laid their eggs in the ash pile and a pair of robins once built a nest on the step of an open stairway at the pump house.

(Since writing the above the bluebirds' other two eggs have hatched and now there are three husky looking young bluebirds in the refinery pipe line and we wish these young pioneers all the success possible.)

Cheswell J. Hunt

BIRD HAVEN

One of the most recent acquisitions of the University of Chicago is an interesting tract of woodland in southern Illinois. This area, which has been known as *Bird Haven*, was for a long time the property of Dr. Robert Ridgeway, the famous ornithologist. This tract is located near Olney, in Richland County, Illinois, 230 miles south of Chicago. The Bird Haven tract was founded by Dr. Robert Ridgeway in 1906, and was cared for by him until his death, March 15, 1929.

Dr. Ridgeway's desire when he founded Bird Haven was not only to make it a bird sanctuary, but also an arboretum. He had already obtained many

trees and shrubs characteristic of Illinois and he desired to have in the Bird Haven area representatives of all the trees native to the state and also such trees from elsewhere as would grow to advantage in Bird Haven. The area is well suited to this purpose, having considerable diversity of topography and soil, and containing tracts of upland, shady slopes, ravines, and creek bottoms. Dr. Ridgeway before his death, had planted many exotic trees and shrubs, especially species of magnolia and others suited to the place.

During his lifetime Dr. Ridgeway was always anxious to arrange for the permanent conservation of this interesting property. Several years ago there was founded a national organization of his friends, known as the Bird Haven Memorial Association. This Association was organized to raise funds for the purchase of additional land and also for the purpose of insuring the upkeep of the tract. After much campaigning by the Association, a fund of \$30,000 was raised, but this was insufficient. Mrs. Charles L. Hutchinson generously donated additional funds to increase the amount to \$50,000 and also bought the 97 acres adjoining Bird Haven's original 18 acres.

The area is now sufficiently large for carrying out Dr. Ridgeway's desires. The fund is now officially known as the Robert Ridgeway Memorial, and is very fittingly named after one of the most ardent naturalists our country has ever produced. Dr. Ridgeway's body is interred in the area in accordance with his wishes.

In February 1932 the tract was given to the University of Chicago, together with the funds noted above, and will in the future be administered through the University. It is hoped that many botanists and zoologists will find Bird Haven a good place for carrying on experimental work and observational studies on plant and animal life.

from The University Record

MIGRATION

The great fall movement of birds is now on its way and has been for several weeks. The majority of shore birds have long since passed through the Chicago area; they came singly and in flocks, paused to feed along the retreating shore line of our prairie pools, and then winged their way onward, many eventually to make the long trek across the Gulf of Mexico to the lands which lie beyond the equator.

What causes this great seasonal movement? Why should birds which nest far beyond the arctic circle keep on moving southward after they once reach a place where food requirements and climatic conditions are favorable? Why should they not stop along the Louisiana coast instead of migrating on to far off Argentina? Are they merely restless spirits, not satisfied with things near at hand, or do they continue to make their long journey merely because their ancestors made similar flights? We know that individuals of many species return to the same region and

often the identical spot, year after year, to nest. Is it probable that they also go to the same wintering ground, taking their young with them? Could not this family extend its southward range a few miles, due to favorable food supply, and so the next year, instead of stopping at the old stand, continue on to new feeding grounds? And during the passing of generations of birds, could not these long seasonal migrations have been developed gradually, merely because of that instinct which causes a bird to find its nesting or wintering ground of the year before? The nesting site may have been destroyed, the bird *must* nest, and the next favorable site is miles to the northward, or if it is the fall, food conditions may not have been favorable, and the birds, adults and young, extended their range southward. Would they have made similar journeys the following seasons and through that instinct which guides them to favorite haunts, gradually develop the great migrations which carry them thousands of miles? Is it probable that bird banding, which has shown us definitely that individuals of many species return to identical nesting sites, will solve that age-old problem of why birds migrate? We do not know, we are merely asking.

THE LINDBERGH BEACON

When darkness settles over the city of Chicago, the revolving finger of light from the great Lindbergh Beacon on the Palmolive Building, pierces the void for miles. The dangers of bright lights to migrating birds are well known, so while many of the Passeres were making hurried exits from our area last fall, William I. Lyon and the undersigned made a visit to the beacon at the request of B. A. Massee, of the Palmolive Company (and Scientific Governor of the Academy), to observe them. A stiff wind was blowing from the southwest, but the small migrants had no difficulty in making speed against it.

As we came on to the roof of the tower, we saw objects, like gleaming coals, flashing upward and away with the wind, away from the light, and as soon as our eyes became accustomed to the darkness cut by the glare, we realized that these gleaming objects were small birds rising into and drifting with the wind, their feathers shining like jewels. It was interesting to watch the myriads of birds — a constant stream of them passing the light, with fifteen or twenty in sight at all times.

They were flying against the wind, and although they were apparently blinded by the light, they held their course, for the most part, as long as they were on the right side of the beacon. But the reaction of those coming head on or to the left of the light was different. The birds, blinded by the glare, were flying strongly against the wind, but just before they struck the beacon, they entered the lee caused by the obstruction, and immediately, their forward flight was checked; they raised upward and drifted away like so many wind blown sparks. There is no doubt that the birds were warned of the danger ahead by the sheltered area to the leeward of the tower. It would seem that the danger to the migrants from these great lights depends upon the direction of the wind.

A. M. B.

Program of Activities

of

The Chicago Academy of Sciences

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No. 1



Photograph by F. R. Dickinson

THE STRIPED GROUND SQUIRREL

Citellus tridecemlineatus tridecemlineatus

These small mammals are common in the Chicago area where they inhabit both prairie and bushy regions, but their favorite habitats are grassy fields and dry, open expanses. They are true ground squirrels, living in well made dens and burrows; they are active above ground throughout the warm months. In chill weather, however, they usually remain within their burrows.

The Chicago Academy of Sciences

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1933

Chicago is to be the host of thousands of out of town visitors during the next year; the great World's Fair, with its wonderful buildings and exhibits along the lake front, east of Grant Park, will be the mecca of people from all continents. Naturally, the Academy will draw many of those who come to the city, in addition to the 300,000 who annually visit the halls, and it seems appropriate that our Chicago Environs Groups, depicting animal and plant life which once occurred in this region, should be completed by the time of the fair's opening. The members of the staff are now working on the final group, showing the territory northwest of the city; the great photographic background, sixty feet in length, is completed, the work of coloring is nearly finished, and the foreground will be laid in the near future. Members of the Academy who are interested in seeing these large habitat exhibits in course of preparation, should ask to be shown the group.

WINTER PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during the winter of 1933 in the Assembly Hall, Sundays, at 3:00 P. M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

January 29—Silver Mining in Colorado

Dr. Charles Behre

Dr. Behre, of Northwestern University, has spent considerable time in field work in the west, in the interest of economic geology, part of which was under the auspices of the U. S. Geological Survey, and is well acquainted with the processes of ore mining.

Illustrated with Slides

February 5—Glimpses of the Canadian Rockies

Dr. George K. K. Link

Academy audiences are familiar with Dr. Link's lectures, and on this occasion they are to share with him some of the pleasures of his vacation weeks spent in the northwest.

Illustrated with Slides

February 12—The Mountains of Cascade Range and Yosemite Valley

Dr. Louis J. Tint

Dr. Tint, well known physician and surgeon of Chicago, has a delightful hobby which he pursues devotedly for a part of each year, that of photographing by autochromes the indescribable scenic beauty of our country, particularly that of the Rocky Mountain region.

February 19—Through the Land of the King of Kings

Mr. Alfred M. Bailey

The story of a museum expedition through Ethiopia, illustrated with film by Mr. C. S. Cutting. Mr. Bailey was a member of this expedition from the Field Museum.

Illustrated with Slides and Motion Pictures

February 26—World Highways and Byways

Dr. John R. Ball

Dr. Ball, our Honorary Curator of Invertebrate Paleontology, visited many museums at home and abroad last year, and accumulated a fund of valuable notes which is the basis of his travel talk.

Illustrated with Slides

March 5—With Sled and Reindeer through Lapland

Mrs. Olive Murray Chapman

Mrs. Chapman, world traveler, artist, and author, has made several hazardous trips through Iceland and Finland, learning much of the habits, customs, and superstitions of the natives of these little known countries.

Illustrated with Motion Pictures

BACK-YARD PHOTOGRAPHY

By

F R Dickinson

Our pastures look greener. Many naturalists and many amateur photographers have gazed with envious eyes at motion pictures of wild life in foreign climes, and have longed for first hand experience in surroundings so full of novelty and excitement. To offer for a substitute as simple a pastime as the study and photography of the tame wild life to be found in or near one's own back-yard is to insult the goddess of romance—if such a goddess there be—and yet, believe it or not, there is excitement in seeing a wary chipmunk or deer-mouse creep hesitatingly closer to the field of your waiting lens, and, after many changes of heart and flits of an expressive tail actually appear before your eye, almost screen size, on the ground glass of your camera. The nervous trill of an indignant spermophile may not run down your spine like the roar of a movie tone lion, but if your interest happens to lie in the study of animal instinct, intelligence, and behaviour, you will find the spermophile just as full of action and reaction as any lion in Africa, and much better company at a photographic range of three or four feet. It would seem, moreover, that field work in strange lands always calls for a safari. Whether this term refers to the expedition as a whole or merely to the black and tan boys who carry it about on their heads, I do not know—but in any case, something is always happening to it, and I suspect that the white man in the sun-helmet, who appears suddenly on the screen to bring order from chaos with a few mysterious native swear-words, is not always as collected and self-sufficient as he looks. Now, for field work in the back-yard the problem of the safari is far simpler. Your supplies are a few sheets of galvanized iron, for the sides of the open pen which is your photographic studio, together with a miscellaneous assortment of properties, such as rocks, sand, gravel, and leafy branches with which to construct an attractive and reasonably natural background for your pictures. If, as leader of the expedition, you are unwilling to carry this equipment from the basement door to the corner of the back fence, the colored neighborhood janitor will provide just the right safari touch, with none of the bother.

If you try this pastime and happen to like it, you will be surprised at the variety of small creatures available and interesting to work with. At least a dozen species of mammals can be taken in or near the suburbs of even a large city or on farms close by, to which access may be had. When to these one adds the commoner kinds of reptiles, amphibians, insects, and crustaceans the list becomes quite imposing and includes material for many hours of study and recreation. The beginner will not long remain satisfied with a few snapshots developed and printed by the local druggist, for at least half of the fun comes in preparing one's own negatives, making enlarge-

ments, and carefully adding a few touches of color (not too much) to bring out contrasts concealed by the uniformly gray tones of the uncolored print.

For small mammals a good type of pen may be made by setting on edge three or four sheets of galvanized iron, about thirty-two inches high and five or six feet long, wired end to end to form a continuous wall which may then be so adjusted as to provide a wedge-shaped enclosure three or four feet broad at one end and tapering to a point at the other, where the camera, raised just high enough to look over the edge, may be operated from a low tripod. Underneath the entire pen and with a few inches to spare on all sides, there should be a floor of galvanized wire screening with a mesh of not more than a quarter of an inch, covered with earth or sand. If the ground is level, this will effectually prevent occupants from crawling under the sides of the pen, and a height of thirty-two inches will stop all but the more active species from jumping over. Others will have to be kept in by a removable top of glass or wire,—removable, because when you are ready to photograph, even a glass top has its drawbacks and wire throws disconcerting shadows.

Inside your pen you may now set about building, at the wider end, whatever type of background you think suitable and typical for the creature you are studying; but there is a little more to it than just that. Unless you have time to waste, you must plan your set in such a way that the animal can not too readily conceal itself behind rocks, sod, or other scenery, and must come to a predetermined spot for the food which you will presently offer. One chipmunk with which I worked, spent nearly all his time between some small boulders which formed the background of the picture, and at the end of a week was no tamer than when first caught. The substitution of some flat limestone slabs which held no hiding place forced him into the open where he soon found that I was a harmless, if somewhat eccentric, monstrosity, and within twenty-four hours would perform when and where I wished, in full view of the camera some four and a half feet away. With a six-inch lens and a ground glass focus, pictures having excellent definition, in which the subject occupied the greater part of the field, were obtained at will, and were later enlarged to more than life size without loss of detail, from negatives about an inch in length. In the matter of arranging your scenery a little extra time is well spent. The back wall of the pen must be screened with leaves or other natural objects for a space somewhat larger than the field of the picture, and such rocks or other properties as are employed must not be built up too high, or the subject will disappear over the top of the enclosure in one flying leap.

Much simpler, of course, is the arranging of backgrounds for such creatures as snakes, crawfishes, ants, caterpillars, and other small forms which are neither so active nor so self-conscious as the mammals. An ordinary



Photograph by F. R. Dickinson

EASTERN CHIPMUNK *Tamias striatus griseus*

baking pan filled with flat stones, gravel and water, gave a couple of crawfishes ideal surroundings for the excavation of a home under a rocky ledge, and provided some interesting pictures showing how cleverly they move pebbles about with their clumsy looking claws. Easier still was a series of photographs illustrating part of the life history of the monarch butterfly from the egg to the moment when the chrysalis splits to release its occupant. Ants feeding on the liquid expelled by the aphids were taken in the act with a special lens attachment from a distance of a few inches, without disturbing the milkweed plant which was their restaurant.

As for cameras and lenses, your equipment will depend on what you want to do, and on what you want to spend. In some respects motion pictures are desirable, not only because they show action but because you can select the

best of many frames for enlargements. Except for this, just as much pleasure and information can be gained from using a still camera, particularly if you have a visual focus, a long lens, a fast shutter, and supersensitive film.

Not much has been said about the enjoyment of watching the animals themselves, overcoming their shyness, and persuading them to perform for the camera. This is really the best part of the game, and one which, at times, calls for no little ingenuity. In working with the small mammals it is especially interesting to note the differences in their behavior, and their relative willingness to forget their fear. After putting one of them in the pen, it is a good idea to appear and watch it quietly at fairly frequent intervals, placing a little food at the point where the picture is later to be centered. After it has eaten there a few times, withhold further food for some hours. Then set up your camera, get ready, place more food on the selected spot, and you will soon have your picture. Sometimes the use of a stick seems to accustom chipmunks and spermophiles to the presence of an observer. Animals which will dart to cover at the slightest attempt to reach them with the hand will sit still for five minutes to be stroked with the end of a cane held in the same hand, and appear not to mind being pushed gently along the ground by it.

For animal guests which are to be kept for several days, some protection from exposure to heat and cold should be provided, as well as sufficient food and water. And do not be deceived by their apparent indifference or inability to escape when you are watching them. A loose wire screen or a few boards laid over the pen when you are away will save the necessity of resetting your trap.

A few trials will convince you that for an all-round hobby providing occupation for hand and mind in summer or winter, indoors and out, the study of small and accessible forms of wild life, and the recording of their actions by means of the camera have many recommendations. And if you feel apologetic because your animal friends are less imposing in size than the lions, rhinos, hippos, hartebeests, wildebeests, and other beasts of the public screen, just turn to a scientific book on mammals and look up the real names of these various animals. That roaring lion is only *Felis leo* after all, whereas your deer mouse is *Peromyscus leucopus*. That charging rhino is known in his family as *Opsiceros bicornis*, —quite an impressive cognomen, but what of it? The little "striped gopher" of our childhood days has been solemnly baptised by the zoologists as *Citellus tridecemlineatus*. Need anything more be said?

AUTUMN IN THE SMOKIES

As the nights became increasingly colder at the Academy's camp in these "friendliest mountains" and the deep virgin forest correspondingly changed into autumn foliage we moved our camp just under the divide and studied the fauna of the peaks from Mt. Kephart to Siler's Bald—the backbone of the highest mountain range east of the Rockies. As the season advanced, the colors

deepened and we called the forests unreal, for never before had we seen such an intensity of reds, yellows, and orange,—colors were on a rampage. Mountains nowhere could be more beautiful. Within these colorful forests the red squirrel was seen storing a plentiful supply of black walnuts and his small cousin, the chipmunk, was collecting and gathering small nuts and seeds. Among the mountain folk autumn also was a season of increased activity for crops had to be harvested and a winter's supply of wood had to be cut.

Snows came early this fall and on October 6 a three inch snowfall made a never-to-be-forgotten scene as it clung tenaciously to the abundant multi-colored vegetation—a beautiful setting for a picture, but a rather unpleasant place to work. About this time we were studying the fauna of the divide between Clingman's Dome and Siler's Bald, a sharp, high, rough ridge between North Carolina and Tennessee on either side of which these states spread out below us in waves of mountain ranges. These mountains so impressed the late Horace Kephart that he wrote, "Nearly always there hovers over the high tops and around them, a tenuous mist, a dreamy blue haze, like that of Indian Summer, or deeper. Often it grows so dense as almost to shut out the distant view, as smoke does that has spread from a far-off forest fire. Then it is a 'great smoke' that covers all the outlying world: the rim of the earth is but a few miles away; beyond is mystery, enchantment." Such are the Smokies always, but particularly in the fall.

Several times we had the interesting experience of climbing some peak and collecting in bright sunshine while below us clouds of fog and rain obscured our camp and the surrounding country, only small black "islands", the tops of peaks, showing above the billowy white mass of clouds. On such high tops the raven is rather common. On one frosty morning on top of Clingman's Dome, we were attracted by a melodious call, seeming to come from everywhere, a sound which resembled the clear note of a bell and the quality of trickling water, and reminded one immediately of "Remi" in W. H. Hudson's *Green Mansions*. After much conjuring as to the cause of this note, we were surprised to see a coal black raven float overhead uttering what we thought to be the most beautiful of bird notes. It was hard to believe that the same bird that makes such loud harsh calls could make such beautiful sounds.

The Smokies are known as a "botanist's paradise," for here is the largest and finest virgin hardwood forest in the United States and also the largest virgin forest of red spruce. Nowhere in eastern United States is there such a variety of plant life in an equal area. There are 152 varieties of trees alone. The work of the Academy's faunal survey thus far has shown that somewhat the same may be said about mammals, for in few places east of the Rockies, in an area of equal size, can as many species of mammals be found. At least 57 species of mammals are known to occur in this region including such large mammals as the black bear, wildcat, raccoon, opossum, skunk, and red and gray foxes.

E. V. Kamarek



NOTES FROM

The Illinois Audubon Society

(Section of Popular Ornithology of The Chicago Academy of Sciences)

A QUERY FROM "THE CLEARING"

We have a feeding bench directly under our drafting room windows. It hangs, so to speak, on the edge of the ravine. A great variety of our winter birds are daily guests.

Yesterday I saw two English sparrows on the table. They were the first sparrows I had seen this winter. A pair of juncos flew on the shelf, and before I was aware of any fight, the juncos chased the sparrows across the ravine where they disappeared amongst the trees. Being busy on the drafting board, I paid no more attention to the birds. After a while, looking out through the windows, I noticed at least a half dozen sparrows busy feeding, and in the trees perhaps two score or more of them waiting for their turn. All other birds had disappeared.

This was an unusual thing to me, as at the feeding table in our little yard at Wilmette, sparrows, squirrels, cardinals, and juncos seem to feed together without any fuss. I did not approve of this change in our guests, and stepped up to the window. The sparrows gave signs of nervousness and soon left the shelter. I remained at the window at least five minutes until the whole flock had flown away from the ravine. Not very long after, the juncos, nuthatches, and chickadees were again at their old stand.

Did the sparrows go for help? If they did, it was a new adventure in my study of birds.

Jens Jensen

THE HORNED LARK IN LABRADOR

Audubon visited the rugged shores of the Canadian Labrador in his chartered schooner *Ripley*, in the summer of 1833, and in *The Labrador Journal* we find many references to the "Shore Lark" (*Otocoris alpestris alpestris*), which we now call the horned lark. Apparently, these little birds were favorites with Audubon, for he was continually hoping to find a nest that he might make his drawings. On July 24, 1833, he records: "The *Charadrius semipalmatus* breeds on the tops or sides of the high hills, and amid the moss of this country. I have not found the nest but have been so very near the spot where it undoubtedly was, that the female has moved before me, trailing her wings and spreading her tail to draw me away; uttering a plaintive note, the purpose of which I easily conceive. The Shore Lark has served us the same way; the nest must also be placed amid the deep mosses, over which these beautiful birds run as nimbly as can be imagined. They have the power of giving two notes, so very different from each other that a person not seeing the bird would be inclined to believe that two birds of different species were at hand. Often after these notes comes a sweet trill; all these I have thought were in intimation of danger, and with the wish to induce the sitting mate to lie quiet and silent."

On July 29, he wrote: "I have today drawn three young Shore Larks (*Alauda alpestris*), the first ever portrayed by man. I did wish to draw an adult male, in full summer plumage, but could not get a handsome one. In one month, all these birds must leave the coast, or begin to suffer."

During the past summer the field party from the Academy followed along Audubon's route, and succeeded in making good motion film studies of the horned lark, nesting in the deep moss of an exposed hillside. The nest was a neat little cup, well concealed amid a clump of the picturesque cotton grass. The adults were confiding little creatures, and had little hesitation in returning to the five brownish eggs, even though the photographer's blind was thrashing wildly in the wind.

Just recently, Mr. Fred Osborne, caretaker of the St. Mary's Sanctuary, wrote regarding a pair of these birds: "I am wondering if you ever knew of young horned larks feeding from one's mouth. We have had a few birds around the lighthouse for a long while, and a pair of young became exceedingly tame; in fact, they became so fearless that we could take bread or cake crumbs in our lips, and when we would stretch out flat on a rock near the door, they would come directly to us. They would eat their fill, chirping all the while—and we had no films to take pictures! It's just too bad we could not have had your motion picture camera."

Mr. Osborne is the lighthouse keeper, and he has been a protector of the bird life of that wonderful government sanctuary for many years.

A. M. Balley.

WINTER NOTES

The "clear, bracing air of winter" is with us again, and many out-of-doors enthusiasts are taking long excursions through our fields and forests. A few of the summer residents still linger where shelter and food are sufficient for their needs, but the majority have long since made their southward trek. What of our winter birds? Have the waxwings returned in abundance, as in the winter past, or have the saw-whets come to visit our tangled thickets? It is an easy matter to keep daily records on file by means of bird cards (available at the Academy office for one cent each). The early spring observations of Mr. Carlyle Morris last season are of interest, and are of value to check conditions in years to come. He has submitted notes as follows:

April 2, 1932, Thatcher's Woods, River Forest, Illinois, 7:15 to 9:50 a.m.
Fox Sparrow, 6; Song Sparrow, 3; Belted Kingfisher, 1; Golden-crowned Kinglet, 3; (very abundant this spring); Starling, 6; Phoebe, 2; Yellow-bellied Sapsucker, 5; Tufted Titmice, 2; Bluebird, 1; Chewink, 1 (singing); Brown Creeper, 1; Junco, 4; Chickadee, 1; Downy Woodpecker, a pair; and nine other common species.

"Bohemian Waxwing. April 3, 1932, I came upon a flock of twelve of these lovely birds feeding upon some berries on shrubs in front of the house at the corner of Kenilworth Avenue and Erie Street, Oak Park. I watched them for nearly fifteen minutes, noting the yellow bands across the ends of the tails, the black markings around the face, and the sealing-wax like marks on the wings. They lisped (or chirped, if you can call it that) several times.

"April 6, 1932, Mud Lake Region, Lyons, Illinois, 9:30 to 11:58 A.M.
Cowbird, 4 or 5 (both sexes); Red-winged Blackbird, 30 plus; Pectoral Sandpiper, 32; Killdeer, 2; Hermit Thrush, 1; Chewink, 2; Golden-crowned Kinglet, 5; Meadowlark, 3; Sapsucker, 1; Herring Gull, 2; Fox Sparrow, 3 (Singing); Brown Creeper, 2; and twelve other common species."

Members should remember that their observations are of interest. It is desirable to record—in writing—each tramp afield, listing not only the birds, but mammals and other animal life as well, that we may accumulate notes which will be available to those desiring authentic data of our wild life. But we wish Mr. Morris had listed the "other common species."

The Audubon Society is preparing to publish the new check list of the Birds of Illinois, and Messrs. Gault, Ford, and Eifrig need information. Anyone having unusual records should send their notes to our Academy office.

The Annual Bulletin of the Society is now in course of preparation. Members are urged to send in their data that the Bulletin may reflect the activities from all parts of the state. The Annual will be out in early February, so the notes are needed immediately. Mr. Jesse L. Smith is responsible for securing copy, as in years past, while Mr. E. R. Ford is chairman of the publication committee, and copy should be sent to him at the Academy.

ANNUAL REPORT OF THE RECORDING SECRETARY

The Illinois Audubon Society's year has passed in a peaceful manner, successful financially in spite of hard times, and with no particularly spectacular accomplishments, but, I hope, becoming more firmly established in the consciousness of the needs and possibilities of our existence.

Regular meetings of the Board of Directors have been held. Mr. Ford's presence on the Board in Mr. Folsom's place has been a great help. Mr. DeLoach's resignation was accepted with regret.

The special meeting of the organization was held April 19 at the Academy, when Mr. Walter W. Bennett of Sioux City, Iowa, President of the Iowa Audubon Society, lectured on the Prairie Chicken. Invitations to the Academy lectures were sent to all members. The annual trip to Riverside was held May 14 with 200 present, and 67 species of birds were identified.

Dr. Eifrig was appointed by Governor Emmerson a delegate to the National Conference on State Parks and Mr. Pattee has been made our representative on the Clean Stream Advisory Committee for the Forest Preserve. The delegates to the Conservation Council have been Mrs. Richardson, Mrs. Pattee and Mr. Schantz.

The particular work of the Council this year for the birds has been the saving of the Orland Slough for a bird refuge by the Commissioners of the Cook County Forest Preserve. A museum is now being maintained in the Forest Preserve at River Forest by the Chicago Academy of Sciences, with the cooperation of the Commissioners, which will be of great value in teaching conservation and an appreciation for our native plants and animals.

The Annual Bulletin of the year is an admirable publication upon which many compliments were received, and the pages in the Academy's quarterly have been a splendid aid in keeping our members acquainted with the activities of the Society.

In addition, the By-Laws were printed, and also, a pamphlet of information regarding our organization. Many of them were given out at our booth at the Flower Show held April 2-9, and seventy-five dollar's worth of other publications were sold. There is a constant sale of material at the Academy office where free information is also given. New shipping boxes for lantern slides have been made, so that our members may obtain slides with less likelihood of breakage.

The new edition of the Check List is not yet published, but it is in the hands of three of the foremost ornithologists of the region, Mr. Ford and Dr. Eifrig assisting Mr. Gault. There is an enormous amount of labor in compiling the necessary data, and the committee hopes to have a work which will be of service for years to come.

Catharine A. Mitchell.

Program of Activities
of
The Chicago Academy of Sciences

Vol. 4.

April, 1933

No. 2.

BIRDS
OF THE REGION OF
POINT BARROW, ALASKA

By

ALFRED M. BAILEY, CHARLES D. BROWER,

and

LOUIS B. BISHOP

Chicago, Illinois, April 20, 1933

Price 25 cents

The Chicago Academy of Sciences

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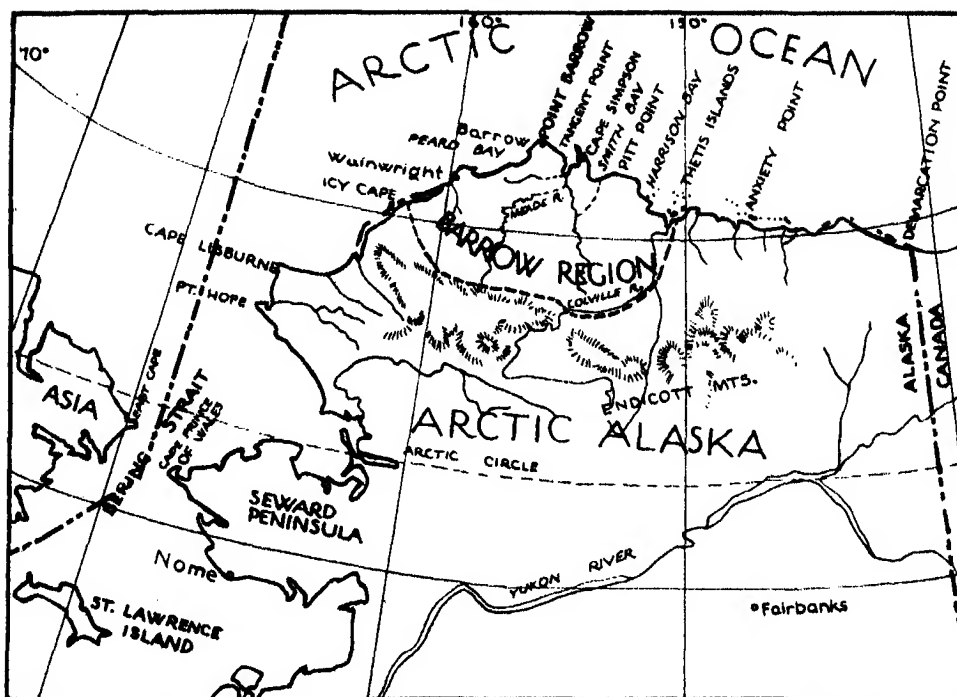
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ACADEMY PUBLICATION PROGRAM

In Volume I of the Transactions of the Chicago Academy of Sciences, published in 1867, appeared the first paper on Alaskan birds after American occupation, under the title "List of Birds of Alaska, with Biographical Notes" By Wm. H. Dall and H. M. Bannister. This work, now one of the most difficult publications to obtain, was based on the collections made on the Russo-American Telegraph Expedition in northern Alaska, on which Robert Kennicott, the first director of the Academy, lost his life.

At a recent meeting of the Board of Scientific Governors, an editorial committee composed of Dr. V. O. Graham, Messrs. F. R. Dickinson and Tappan Gregory was appointed to work with the director in resuming the printing of short papers, and it is planned to use space in our quarterly bulletin for the purpose. It seems appropriate, therefore, to publish the following notes on a region which has been of interest to members of the Academy. The representative of the Academy at Barrow, Mr. Charles D. Brower has made such notable contributions that the collections now have a very fine representation of arctic birds.

The officers of the Illinois Audubon Society voted to make the space, which has been reserved for their organization, available for these papers; other articles at hand, dealing with natural history will appear as space permits as joint contributions of the Illinois Audubon Society and the Academy.



BIRDS OF THE REGION OF POINT BARROW, ALASKA

By

Alfred M. Bailey, Charles D. Brower, and Louis B. Bishop

The birds of the northern coast of Alaska have become rather well known during the past thirty years, due to the activities of various collectors, but the records are so scattered, and so many of the publications are not readily available, that it seems advisable to compile the notes in one list.

Point Barrow, in latitude $71^{\circ} 23'$ north and longitude $156^{\circ} 40'$ west, the northernmost point of Alaska, is about 300 miles north of the arctic circle; it was first discovered by Mr. Elson, master of *H. M. S. Blossom*, commanded by Captain Beechey, in August, 1826, and is described by Beechey¹ in the reports of this voyage to the Pacific and Arctic during the years 1825-8. According to Ray,² the next visits by white men were made by Captains Dease and Simpson in July, 1837, who came down the Mackenzie to the ocean and followed along the coast to Return Reef, where Franklin was forced back by ice in 1826; there they found the ice fast to the land, and they walked the remainder of the way to the northern point. Nearly twenty years later, 1852-4, *H. M. S. Plover* wintered at Barrow, and from that time on the coast was visited by whalers who followed the bowhead whale into the arctic pack.

The first ornithological records of importance specifically from Barrow, are those of Dr. E. W. Nelson, in August, 1881.³ An expedition led by Lieut. P. H. Ray spent two years, from September 8, 1881 to August 25, 1883, at Barrow, and the ornithological report was prepared by John Murdoch. He collected or ob-

1. Narrative of a voyage to the Pacific and Bering Strait to co-operate with the Polar Expedition, performed in His Majesty's Ship *Blossom*, under the Command of Captain F. W. Beechey, R. N., in the years 1825, 26, 27, 28. London, 1831, p. 301, ff.

2. Report of the International Polar Expedition to Point Barrow, Alaska. Washington, 1885, p. 22.

3. E. W. Nelson, Cruise of the Revenue Steamer *Corwin*, 1883.

served fifty-four species and sub-species, and his notes are included in the report of the expedition. ⁴ Murdoch questioned some of Dr. Nelson's observations at Barrow, ⁵ because of Nelson's short stay at the point, and Nelson replied rather sharply, ⁶ stating that two years of field work by any one man in any one place did not necessarily exhaust the possibilities for further research. Nelson's contention has been well sustained, for all the species questioned by Murdoch and many others have been taken in later years, so that the Barrow list now includes more than one hundred and twenty species and subspecies.

The E. A. Mcllhenny Expedition worked at Point Barrow from August, 1897, to the same month in 1898. Dr. Witmer Stone reported on the splendid collection of birds and mammals, ⁷ which added thirteen species to the list of birds of the Barrow area. Other naturalists spent a few days at a time in the region during the years following: F. S. Hershey made a cruise in the coastguard cutter *Bear* to Barrow in 1914; Joseph Dixon touched at Wainwright the latter part of August, 1914, but obtained no records for the region. Alfred M. Bailey, assisted by R. W. Hendee, led the Arctic Expedition for the Colorado Museum of Natural History, which made its headquarters at Wainwright, one hundred miles down the coast from Barrow, and worked from August, 1921, to August, 1922, making an extensive collection. Bailey recorded their notes on the birds listing several species new to the region. ⁸ Bailey and Hendee made trips to Barrow from Wainwright and secured the co-operation of Charles D. Brower, who since then has made an intensive study of the birds of that part of the arctic coast, and has sent specimens to the Colorado Museum of Natural History, the Chicago Academy of Sciences, the San Diego Museum of Natural History, and to various individuals, particularly to Dr. Louis B. Bishop.

Brower has made his home at Point Barrow since 1884, and is familiar with the entire region covered by these notes; he has made many trips of exploration with the Eskimos at all times of the year, and so has been able to add many records from the arctic coast.

Bishop has included in this article notes on all the Barrow specimens of interest in his collection, and is responsible for the identification of the birds in his possession, as well as for certain specimens in the Colorado Museum of Natural History and in the Chicago Academy of Sciences. Brower and Bailey are responsible for ranges, nesting habits, and other items, except those taken from other reports as indicated, while Bailey has compiled the various records.

We have considered that great coastal plain north of the Endicott Range, lying between Icy Cape on the southwest and the Colville River on the east, as the Barrow Region. Icy Cape is about 150 miles from the village of Barrow, and the mouth of the Colville River is a similar distance to the southeast. Conditions are much the same in all parts of this area—low lying tundra facing the Arctic Ocean, with barren grounds reaching back to the foothills; small streams have cut their way through the arctic prairies, and along sheltered banks, inland from the coast, are stands of arctic willows which offer excellent homes for small birds.

The tundra is covered with short growths of grass and moss, and is dotted with a myriad of lakes and lagoons, affording excellent breeding grounds for the numbers of water fowl which migrate beyond the arctic circle each season. The summer is very short, so the spring migration usually opens with a flood of winged visitors who begin nesting almost immediately after their arrival. The young of most species are on the wing, and many of the adults and young have started to drift southward by the middle of August. Brower, who now ranks as Barrow's "oldest inhabitant," is responsible for the assertion that Barrow has

4. John Murdoch, Report International Polar Expedition, 1885.

5. Idem., Auk, II, 200-201, 1885.

6. E. W. Nelson, Auk, II, 239-241, 1885.

7. Witmer Stone, Proc. Acad. Nat. Sci. Phila., 1900 (1901), 4-49.

8. Alfred M. Bailey, Condor, XXVII and XXVIII, 1925-1926.

the finest all-year-around climate in the world, and in addition is the best of all winter resorts! Temperatures are rather uniform during the winter, it is rarely much lower than forty degrees below zero, although Brower does remember one month, in years past, when the temperature failed to rise above fifty below.

It has been the custom of all collectors in the north to rely upon the help of the natives in securing and caring for specimens, and as the natives take a real interest in the work, many excellent records have been secured which otherwise would have been lost. Scarcely a season goes by without another winged stranger appearing at Barrow and many of the records included in the following list are based upon single specimens. Several Asiatic wanderers, such as the rufous-necked sandpiper, the dotterel, and red-spotted blue-throat, have found their way to the northern point, while many North American birds taken there seem just as far out of their range. It would appear that most of the migrants which regularly range into Canada would, in time, be taken within the area covered by this paper. Many birds have undoubtedly been blown from their course by storms, while others probably range northward after their breeding season, and are more common than the few records indicate. It must be understood that the seasons are so variable at Barrow, and that conditions differ so from year to year, that some species may be few in numbers at one time and very plentiful at another. Food supply, however, is probably more important than weather in determining the number of birds.

All the species listed below are recognized from the Barrow region on the basis of specimens actually collected, except one or two, as noted. Wherever specimens are likely to be of interest, we have included their catalogue numbers, with initials of the collection in which they are preserved. Those in the L. B. Bishop collection are indicated by "L.B.B."; in the Colorado Museum of Natural History, by "C.M.N.H."; in the Chicago Academy of Sciences, by "C.A.S."; in the San Diego Museum, by "S.D.M."; and, in the Philadelphia Academy of Natural Sciences, by "P.A.N.S." We have not attempted to give extensive notes on the habits or on the plumage of the birds—such information is contained in the various published lists, and the reader is referred to the bibliography for further information. The authors wish to express their indebtedness to the late Mr. Outram Bangs and to Messrs. James L. Peters, L. M. Huey, George Willett, J. D. Figgins, and Stanley Jewett for aid in identifying specimens, and to Mrs. Henry Greist of Point Barrow, who preserved several interesting specimens during Mr. Brower's absence in 1931. Mrs. Greist also sent specimens to R. M. Barnes, records which are herewith included. All specimens collected by Brower, unless otherwise indicated were taken in the vicinity of the village of Barrow.



Gavia adamsi Yellow-billed Loon. At times this big loon is extremely common during migration. In the latter part of May, when the winds are favorable, it is not unusual to see hundreds in the course of a day, as they follow along the open leads. Their nests are upon the larger inland lakes, and as travel is difficult at that season—the first two weeks of July—the nests are infrequently found. The majority of these loons nest eastward of the Barrow region, but they are regular nesting birds of the area, and several sets of their eggs have been collected in the past few years. The natives believe the breeding bird to be extremely vicious, but a pair with a nest at Cape Prince of Wales could not be approached within rifle range.⁹

Gavia arctica pacifica Pacific Loon. These are common birds along the arctic coast of Alaska. They arrive at Barrow about the first of June and nest throughout the region upon the shores of tundra lakes. Fresh eggs are found during the first week of July. Many are seen along the coast during the fall, but they are usually wild and difficult to approach. The Eskimos claim that the ponds often freeze before the young are able to fly, and that well into September it is a common sight to see adults flying inland, carrying fish.

Gavia arctica viridigularis Green-throated Loon. This form seems to occur regularly at Cape Prince of Wales, but only three specimens have been taken within the Barrow region. An adult male and female taken June 1, and June 26, 1928, respectively, (L.B.B. 42717-8) are not typical, and may be intergrades. There is a specimen in the Dwight Jr. (No. 8259) collection at the American Museum of Natural History, which Dwight had recognized, and placed in a tray with Asiatic skins. It is a male adult taken by E. A. Mcllhenny August 15, 1899.

Gavia stellata Red-throated Loon. This is the common loon of the region, and a characteristic sound of the arctic is their resonant, far reaching, "Kok-ar-row." They arrive early in June and start nesting in July. Fresh eggs are found along the grass grown borders of tundra lakes about July 5th. These birds seem to prefer marshy areas for their nests, and will often choose a little grass grown waterway, while the other divers prefer plenty of open water. Like the Pacific loon, this form comes to the ocean in the fall, and it is a common sight to see adults and young swimming just beyond the first row of breakers. The majority leaves for the south before the middle of September, but a few may be observed in early October.

Colymbus auritus Horned Grebe. Two specimens have been recorded, an adult taken early in July, 1930 (L.B.B. 45286), which was secured in the ice near Flaxman Island by an Eskimo, and another, a beautiful adult, taken offshore at Barrow, May 15, 1931, (C.A.S. 5235).

Puffinus tenuirostris Slender-billed Shearwater. This form is irregular in occurrence. Hendee found a dead specimen upon the beach at Wainwright, September 4, 1921. Brower reports them extremely common occasionally. They occurred near Barrow by thousands from September to October, 1929; the only ones taken, however, were collected from slush ice where they had apparently been trapped, and some which the Eskimos found frozen in the ice. Two specimens in the Bishop collection were found dead thirty to thirty-five miles inland, November 13-19, 1929, the birds doubtlessly mistaking the flat, snow-covered tundra for the level sea ice. There are three specimens from the region in the C.A.S. collection.

9. Ibid., XXVII, 29, 1925.

Fulmarus glacialis rodgersi Pacific Fulmar. These wonderful fliers occur offshore regularly during the summer, as stragglers from the breeding grounds. Hendee took four specimens at Wainwright, two of which were caught in traps built for foxes, on June 14; the other two were taken July 27 and August 5. Brower has taken a few specimens, among them an adult female in the L.B.B. collection which was found dead upon the beach September 11, 1929. There are two females (Nos. 14968-9) in the S.D.M.

Phalacrocorax pelagicus pelagicus Pelagic Cormorant. This is a straggler on the coast, and has only been noted a few times. Bailey records one found dead at Wainwright in mid-winter (January 24, 1922), and Brower saw one over the lead in the spring of 1930. He reports shooting one about thirty years ago which was such a curiosity with the natives that they traded a white fox for it so they could use the feathers for charms. McIlhenny collected a male June 8, 1898, which Stone called *robustus*.

Cygnus columbianus Whistling Swan. A few stragglers are seen each season; the Eskimos say that a few nest near Cape Halkett, and Brower secured a young male from along the Meade River (L.B.B. 42954) in late September, 1928. Mrs. Greist secured a beautiful adult in 1932, which is now mounted in the R. M. Barnes collection.

Branta canadensis leucopareia Lesser Canada Goose. Small geese of this genus are rare at Barrow, occurring merely as stragglers, although we have a nesting record for the past season. Two birds (C.A.S. 5251-5252) were secured along the Meade River with a set of six eggs (W. C. Hanna collection). The birds appear to be typical examples of the race described by Taverner. In addition, we have another specimen, an adult male collected by Brower east of Barrow, June 10, 1928 (L.B.B. 42791).

Branta canadensis hutchinsi Hutchin's Goose.

Branta canadensis minima Cackling Goose

In addition to the birds mentioned above as *leucopareia*, we have five other small geese from the region. Hendee collected three specimens (C.M.N.H. 8089-90-91), two females and a male, at Wainwright July 5, 1922.¹⁰ The others are an adult female taken June 5, 1928 near Barrow, and an adult male collected to the eastward June 20, 1930 (L.B.B. 42792-45294). The two birds in the Bishop collection have the pale underparts of *hutchinsi*, as defined by Taverner, and must be referred to that form.

The three birds taken by Hendee measure within the range of *minima*, but the two females are light-colored, entirely different appearing birds from the dark colored male. It is possible that this difference in color is due to age, but the birds could not be less than ten months old. If these same birds were taken in the eastern part of the United States, there is no doubt they would be identified as *hutchinsi*. The five birds we have from the area measure as follows:

			Culmen	Wing	Tarsus	Tail
C.M.N.H.	8091	Male	31	406	76	128
C.M.N.H.	8090	Female	29	346	63	120
C.M.N.H.	8089	Female	31	360	65	123
L.B.B.	42792	Female	33	390	63	
L.B.B.	45294	Male	35	405	63	

¹⁰. Ibid., 205.

Branta bernicla hrota American Brant. Among the brant collected at Wainwright and Icy Cape during the fall of 1921 by Bailey and Hendee, are several with light bellies; one a female collected at Icy Cape (C.M.N.H. 8216) September 11, appears to be typical *hrota*, with the underparts strongly contrasted with the dark breast, and the white of the neck confined to a patch on each side. It is probable that the nesting grounds of *hrota* and *nigricans* meet to the eastward, and that a few *hrota* accompany the western birds on the fall migration. ¹¹

Branta nigricans Black Brant. This is the most common of all the nesting ducks and geese near Barrow, their nests being found along the coastal plain in marshy areas, on little islands, or upon the shores of tundra lakes. The sets vary from three to seven, and it is not unusual to find fresh eggs in a nest which contains also eggs well incubated. The birds arrive the last week in May, and nesting operations are advanced by the latter part of June, and young of the year are on the wing by mid-August. There are certain favored spots along the coast where the brant gather in the fall to feed upon seaweed, and the Eskimos go there each season to shoot their winter supply of birds. Several hundred may be killed by a single hunter in a few days' time. ¹² The brant start south rather early, the first flight down the coast being about August 15; many are on their way by the end of the month, and few are to be seen after the second week of September.

Philacte canagica Emperor Goose. This is a mere straggler within the area. The main range of the species is from Seward Peninsula southward. Brower took two adults, male and female (L.B.B. 43823-4) at Barrow July 15, 1929. The Eskimos had never seen one before.

Anser albifrons albifrons White-fronted Goose. This is a rather common nesting bird of the region. It is found in marshy areas along the rivers from one to twenty miles inland. According to the Eskimos and to Brower, the bird does not occur farther away from the ocean. It is not unusual to find small nesting colonies—as many as fifteen to twenty pairs having their nests within an area of a quarter of a mile.

The first arrivals were noted at Wainwright May 27, 1922, and they were plentiful after that date. Two sets of three eggs each were secured July 12 and 25 at Wainwright, and Brower has taken many sets averaging about five eggs, near Barrow in recent years. The best nesting ground for these geese seems to be in the vicinity of Smith's Bay, forty miles east of Barrow; they are found in a strip extending from the beach ten miles inland. The nesting bird lies rather close, oftentimes flushing almost under foot. There are breeding specimens in the L.B.B., C.M.N.H., and C.A.S. collections.

Chen hyperborea hyperborea Lesser Snow Goose. This species was once a common bird near Barrow, but its nests were destroyed by reindeer and herders, and few birds are now seen. An occasional pair nest along the inland rivers throughout the region, and a pair of adults and three downy young were taken along the Chipp River in July, 1928. The birds occur regularly during migration, and a few are killed each season near the native villages. There are several specimens from the region in the L.B.B., C.M.N.H., and C.A.S. collections.

11. Ibid., 203.

12. Ibid., 203.

Dafla acuta acuta European Pintail. Bailey first recorded this form from the coast of Alaska on the basis of specimens identified by Dr. Oberholser.¹³ Later, Dr. Oberholser, in the light of additional material, decided that he was in error, and his decision was published by Bailey in the Condor, 1930.

Dafla acuta acuta however, must be considered as a bird of the Alaskan shores, for Brower took a typical pair (L.B.B. 45766-7) at Barrow, April 19, 1930, when everything was frozen along the arctic, with only occasional potholes in the ocean. Tundra lakes and rivers to the southward were frozen for weeks afterward, and the only logical conclusion is that these birds wandered up the coast from Bering Strait. Brower noticed the difference in size and wrote that the birds were the earliest ever taken, and that they were shot near the village in the midst of a snowstorm. The birds were emaciated. Bishop examined the pintails from the arctic in the Colorado Museum of Natural History, and considered two, C.M.N.H. 9305 and 9870, male and female, taken at Wainwright June 17 and 22, 1922, as undoubtedly belonging to the European race. These birds had been identified by Dr. Oberholser, originally, as *acuta*. In addition to these Asiatic birds, there are six specimens in the S.D.M. which Mr. Huey identified as this race.

Dafla acuta tztzihoa American Pintail. These are fairly common near Barrow, where they nest on the higher knolls along the tundra lakes. They are more common inland than along the coast.

Nettion formosum Baikal Teal. The first record of the species for North America was a male taken by Bailey at Wainwright, September 2, 1921. The specimen is in the Colorado Museum of Natural History.¹⁴

Nyroca marila nearctica Greater Scaup Duck. The first record from the region was one taken at Wainwright October 13, 1921.¹⁵ Brower collected four specimens, an adult female September 30, 1927 (L.B.B. 42049), two juveniles, September 22, 1928 (L.B.B. 42948-9), and an adult male, July, 1931 (C.A.S. 5259).

Clangula hyemalis Old Squaw. This is a very common duck along the Alaskan coast; it arrives over the ocean leads about May 15, and starts nesting along the tundra lakes and on sand islands the latter part of June. The nests, with five or more eggs, are beautifully lined with dark down which is used to cover the eggs when the old one leaves. Great rafts of the birds form offshore during the time they are moulting their wing feathers, and it is no uncommon sight to see hundreds banded together. They remain until well into October, at which time the ice is nearly a foot thick on the tundra ponds, and slush ice is forming in the ocean.

Polysticta stelleri Steller's Eider. This is a common form along the arctic coast, the first arriving at Wainwright the latter part of May (May 25, 1922). The main migration over the leads occurs about June 1st; most of them seem to pass to the eastward of the northern point. Scattered pairs are found over the tundra through the entire region under consideration; the nests are upon the ground along the shores of tundra lakes, and the eggs, usually seven or less, are well concealed in down when left by the female. The males, according to Brower, stay with the females until incubation starts, and then leave for the south. He has never seen a male incubating or with the young. Males occur in small numbers during the late summer months, however.

13. Ibid., 169.

14. Ibid., 169 and XXVI, 193, 1924.

15. Ibid., XXVII, 170, 1925.

Somateria v-nigra Pacific Eider. These birds are extremely common during the spring and fall migrations; they arrive the last week in May in numbers, and a few nest in scattered localities. Hendee found nests at Wainwright on June 30, and downy young were collected on August 5. They are not common in the locality in the fall, however, only a few being seen until late; then, birds which have nested to the eastward appear at Barrow on their southward trek. Very few of this species nest near Barrow, but their nests are numerous on the sand islands east of the Colville River. There are from five to six eggs, and the nests are well lined with down.

Somateria spectabilis King Eider. This species is very common at Barrow and along the whole coast during spring and fall migrations, but few remain to nest, the majority going to sand islands to the eastward. Brower has found a few nests from time to time, one of which contained sixteen eggs. The usual number is seven or less, and sometimes only three. The nests are upon the tundra or upon sandspits, and are well lined with down.

The migration of the eiders at Barrow is an unusual and wonderful sight. The birds drift northward in great flocks when winds are favorable, battalion after battalion straggling slowly over the open leads. They pass the whaling camps by thousands. But it is the flight of the males on their southward trek, as they abandon the females on the nesting grounds, that is the most interesting. There is a certain bit of sand beach bordering a great lagoon some miles away from Barrow, which is the favorite passing place of the eider, and thousands upon thousands pass regularly each season, from mid-July until early August. They seem to come in from islands offshore from Cape Halkett, or from shallow feeding grounds, and cross the favored bit of lagoon and beach. The natives have hunted at this particular spot for generations, and thousands of birds have been killed with the primitive weapons, and many thousands more have been killed with modern shot guns since the coming of white men, but the numbers of birds have not decreased. A few females and young appear during the latter part of the flight, but the majority arrives in September, alighting along the ocean and lagoons as they make a leisurely journey southward. Scattered flocks of adults of both sexes, and young of the year, are seen until late in the season; two flocks were observed on November 9, 1921.

Oftentimes, moulting eiders of all four species form great flocks to the southward of Barrow, drifting about in the open ocean. Brower reports several instances where the natives have driven the birds up on the beach and killed thousands. At Pinachugaruk, about thirty miles up the coast from Wainwright, fully seven thousand were killed in such a drive, in 1920, according to Jim Allen.¹⁶

Arctonetta fischeri Spectacled Eider. This is probably the rarest of the eiders along the north coast, but they occur regularly, and many are killed for food by the natives. They nest sparingly in situations similar to those of the Steller's eider, and the males depart for the south in the same manner. Few birds in eclipse plumage are taken. Hendee recorded these birds for the first time in the spring at Wainwright, on May 28, in company with a few Steller's. They nest in limited numbers in that vicinity, and Bailey and Hendee recorded old females with full grown young in late August and early September. These birds were exceedingly tame, and—of interest to one sojourning in the north—excellent eating. The main breeding ground of the birds seems to be to the eastward of Barrow, on the tundra, not far from the beach, near Cape Halkett and

16. *Ibid.*, 201.

Cape Simpson. Brower has collected nests in that vicinity, and reports that five eggs are the average number in a nest.

Melanitta deglandi White-winged Scoter. McIlhenny collected a male in full plumage, June 22, 1898. This is a rare bird at Barrow, according to Brower; a few have been taken in recent years, but no specific date has been recorded. The white-winged scoter of this region has been described under the name *Melanitta deglandi dixonii*,¹⁷ but is included in the fourth edition of the check list only as a footnote.

Melanitta perspicillata Surf Scoter. This is a rare species within the Barrow area. Hendee took the first record on June 26, 1922, a fine male now in the Colorado Museum of Natural History. Brower has secured a few specimens from east of Barrow which were taken by natives in the fall as the birds were migrating up the Colville River. This seems to be a definite migration route of many of the tundra nesting birds, the flights being made up the various rivers south of the Endicott Range, over the passes of the mountains, and down the Colville, each spring, and a return journey in the fall. It is of interest to note that the primitive Eskimos had a similar trade route, by means of which the natives of the Arctic coast secured trade goods from far off Siberia. One surf scoter in the L.B.B. collection (45293) was an adult male taken east of Barrow August 1, 1930, and there is another male (5258) in the C.A.S. collection taken in the summer of 1931.

Mergus serrator Red-breasted Merganser. This species seems to be a straggler along the coast. Brower secured several birds in 1929 and 1930 which were shot along the beach about eight miles from Barrow. Two are in the Bishop collection, an adult female taken October 15, 1929, and an adult male, June 3, 1930; there are also three adults in the C.A.S. collection, a male and female, taken June 5, 1930, and a male taken in the summer of 1931.

Aquila chrysaetos canadensis Golden Eagle. Occasionally one of this species will wander from the mountains to the coast, but it is extremely rare. Brower has secured two specimens in recent years, one in 1928 which was found dead about fifteen miles from the village (S. D. M. 13303), and the other, a large unsexed adult from the Colville River, in June, 1930 (L.B.B. 45309).

Falco rusticolus obsoletus Gyrfalcon. These large hawks have been taken several times in the Barrow region. Murdoch recorded one under the name *Hierofalco gyrfalco sacer* (identified by Ridgway), which was taken at their station at Barrow when it alighted on the flagstaff, in the autumn of 1882. He saw others which he took to be this form. McIlhenny took two, September and November, 1897,¹⁸ and Brower secured a fine specimen Aug. 10, 1931 (C.A.S. 5249).

Falco peregrinus anatum Duck Hawk. This is a rare species in the area. Bailey lists one collected at Icy Cape September 6, 1922, and another observed the same day.¹⁹ Brower obtained a pair of adults (L.B.B. 46148-9) and a set of five eggs (collection of W. C. Hanna) from outside the area, in June, 1929. They were taken by a native in the Romanoff Mountains, 200 miles east of Barrow. He secured another fine specimen at Barrow in mottled plumage, July 21, 1932 (C.A.S. 5841).

17. W. Sprague Brooks, Bull. Mus. Comp. Zool. LIX, 393, 1915.

18. Stone, op. cit.

19. Bailey, Condor. XXVIII, 124, 1926.



ALASKAN PTARMIGAN

Lagopus lagopus alascensis Alaskan Ptarmigan. This is a common grouse in the area, especially among the willows. In the fall, many come along the coast to feed upon the leaves of the dwarfed willows, but they disappear, for the most part, during the dark days of winter. Many return in the spring if food is available. The dark feathers begin to appear on the head and neck about the middle of May, and a week or so later, these parts are nearly brown. Nesting starts the latter part of June. There is a set of eight eggs in the Hanna collection, secured by Brower along the Meade River, on June 15, 1932.

Lagopus rupestris kelloggae Rock Ptarmigan. This is essentially a bird of the hills, and while a few are found scattered over the tundra in the Barrow area, the majority of them live in the mountains far back from the coast. Bands of young with a few adults occur along the coast in the fall, especially to the eastward of Barrow. Hendee took a dozen specimens at Wainwright May 28-30, 1922, which were the only ones he saw during the entire season. In considering specimens from Barrow as *kelloggae*, we are merely following the ranges given in the fourth edition of the check list. Mr. Hanna has a set of eight eggs, secured by Brower along the Meade River, June 13, 1932.

Grus canadensis canadensis Little Brown Crane. Cranes are rarely seen within the Barrow region. Brower shot two on the fourth of July, many years ago, and McIlhenny collected two in rusty plumage, June 25, 1898. One bird was seen over the village in July, 1930.

Charadrius semipalmatus Semipalmated Plover. This is a rare straggler in the area. The first specimen collected was one by Hendee, now in the C.M.N.H. collection, from Wainwright, June 2, 1922; another one, an adult male (L.B.B. 45806) was taken by Brower at Barrow, June 16, 1930, and R. M. Barnes has a specimen taken by Mrs. Greist in 1930. The species was first observed by Nelson, who saw a pair feeding on the sandy beach August 18, 1881.²⁰

Eudromias mortinellus Dotterel. The second record of this species for continental North America was made when Brower collected a pair (L.B.B. 45802-3), the male on June 14, 1930, and the female two days later; the female would have laid within a few days. The first recorded were taken at Cape Prince of Wales on June 15 and 19, 1929,²¹ and a third at Wales, in 1931. The fact that the dotterel should be taken along the Alaskan coast in three successive years, and that there are other records of Asiatic visitors, shows that stragglers from the Siberian shore are more common than is realized.

Pluvialis dominica dominica American Golden Plover—

Pluvialis dominica fulva Pacific Golden Plover. These two forms are so similar that field identification is impossible, so our knowledge of their range depends upon specimens collected. The Barrow region appears to be the meeting place of the two races; the common bird at the village of Barrow is *dominica*, while that at Wainwright, just a hundred miles down the coast, is *fulva*, if the few specimens collected in each place are bases for such a statement. There are two birds from Barrow, which appear to be *fulva* (L.B.B. 45812-3), adult females taken June 4 and 24, 1930, while the majority of birds taken by Bailey and Hendee at Wainwright were also the *fulva*; many, however, were intermediate.²² There are many specimens of *dominica* from Barrow in the L.B.B. and C.A.S. collections.

The plovers arrive about the first week in June, and scatter over the tundra in pairs; they are vociferous at this time, and may be heard calling at all hours. They vary in numbers in different years; sometimes they nest in abundance, as many as twenty nests being observed in a single season, while at other times only one or two nests are found. The birds seem to be more plentiful inland than along the coast, probably due to the fact that reindeer have been grazing along the coast for so many years that the birds have been forced back along the rivers. The plovers choose rather high ground to nest upon, the eggs being placed in cuplike depressions in the moss. Brower has found that both sexes incubate the eggs.

Squatarola squatarola Black-bellied Plover. This species is irregular in its occurrence; some years very few will be seen, while during others it will be fairly common. They nest on high ground in the same locality preferred by the buff-breasted sandpipers, and Brower has succeeded in obtaining a fine series of eggs from the vicinity of Barrow.

Arenaria interpres morinella Ruddy Turnstone. These beautiful waders are not abundant within the area; a few pass in migration in spring and fall, and a limited number remain throughout the season. They nest in the open, depositing the eggs upon a black bit of earth or dark colored moss, and often-times the adult will be seen before it flushes from the nest. In 1928 Brower located four nests in an area of thirty square feet, the only time he ever found more than one set in a given locality.

²⁰ E. W. Nelson, Auk, II, 239, 1885.

²² Ibid. XXVII, 85, 1926.

²¹ A. M. Bailey, Condor, XXXII, 161, 1930

Phaeopus borealis Eskimo Curlew. This bird, which is nearly extinct, is recorded from Barrow by Murdoch. Even in 1882, it was not a common form. Of this fine bird, known to the Eskimos as "tura-tura," Murdoch says, "This is a rather irregular summer visitor, and by no means common, although well known to the natives. In the spring of 1882 it was the first wader to arrive, but in 1883 we saw none at all. Two flocks of about twelve each arrived on May 20, when there was still much snow on the tundra and in the lagoons, moving up the beach toward the northeast. No others were seen until the first week in July when two were noticed, one associating with a flock of golden plovers and knots. One taken at the time, was already moulting."

Calidris canutus rufus American Knot. These are regular, although rather rare migrants along the coast in spring and fall. They nest far to the eastward, apparently, for they are not seen during the summer months; a few stragglers, adults and young, pass along the coast in the fall. It is quite probable that the species uses the Colville valley as a short cut to the Pacific coast. Bailey took two immature males at Wainwright August 15 and 16, 1921, and there are several specimens in the L.B.B. collection taken by Brower at Barrow, and one in the C.A.S. (5256) secured June 18, 1931. The last mentioned was a belly-picked bird, and was possibly nesting in the vicinity.

Pisobia melanotos Pectoral Sandpiper. These sandpipers are common breeding birds of the area; they arrive about the first of June and begin their courtship antics. Their nests are well concealed in long grass upon the ridges; Brower has collected several sets during the past few years. Excellent accounts of their mating and nesting have been written by Nelson and by Murdoch, and the reader is referred to their articles. The birds have a wide breeding range which extends from the Yukon northward along the entire coast.

Pisobia fuscicollis White-rumped Sandpiper. This is a rare straggler in the region, apparently, for few have been observed. Murdoch took two (June 6 and July 6, 1883). Five were collected by the McIlhenny expedition in June, 1898, and all were in full nuptial plumage, showing no signs of moult; the next observed were by Hendee at Wainwright when he saw several about the village on June 27, 1922. He collected a specimen on July 3 and observed that, although the bird resembled the Baird sandpiper upon the ground, "it attracted my attention by trying to escape by running, whereas the Baird sandpiper almost invariably flies. On wing, the white rump was conspicuous, the heavier marking on the breast being also noticeable".²³ It is possible the bird is more common than supposed, and that it has been overlooked by the few naturalists who have worked the region, because of its similarity to Baird's sandpiper.

Pisobia bairdi Baird's Sandpiper. These are common nesting birds of the region. They first appear the latter part of May, and are plentiful by the second week of June. They are not seen in flocks at this time, but are scattered over the arctic prairies in pairs. The nests are on the higher ridges, along salt water lagoons, in dried grass, or upon the bare tundra, with little covering. The reader is referred to Dixon's "The Home Life of the Baird's Sandpiper"²⁴ and Bailey's notes²⁵ for data on their mating habits. They nest from the Yukon River to at least as far east as Demarcation Point.

23. Ibid., XXVII, 31, 1925.

24. Joseph Dixon, Condor, XIX, 77-84, 1917.

25. Bailey, Condor, XXVIII, 32.

Pisobia minutilla Least Sandpiper. We find but two records for this species from the region, one taken by Hendee at Wainwright, on August 6, 1922²⁶ and the other a set of eggs and an adult taken at Barrow by Mrs. Greist during the summer of 1932 in the R. M. Barnes collection.

Pisobia ruficollis Rufous-necked Sandpiper. This little Siberian shore bird is a straggler along the coast, although it probably breeds, because the only record from the area was a bird of the year. It was collected on August 15, 1922 by Hendee, and is now in the collection of the C.M.N.H.²⁷

Erolia testacea Curlew Sandpiper. The only record from Alaska for this species is an adult male in full breeding plumage, taken by Murdoch on June 6, 1883, at Barrow. "It was in company with a good sized flock of *Actrodromas maculata*" (*P. melanotos*).

Pelidna alpina sakhalina Red-backed Sandpiper. The most common of the sandpipers in the Barrow region; they arrive the latter part of May, and are conspicuous upon the snow-dotted tundra from that time on. They do not seem to have any particular choice in nesting sites, the four protectively colored eggs being placed in cup-like nests lined with willow leaves and moss, in dried grass upon the ridges or in marshy areas. They start nesting in the middle of June, and downy young are seen by the second week of July. The adults and young of the year form large flocks the latter part of August and feed along the sandy shores of the lagoons; the southward migration begins early in September, and only an occasional straggler is apt to be seen after the middle of the month. ("*Sakhalina*, the bird of northeastern Asia, is easily separable from the American race, as the bill of the latter is much longer in both sexes, and the latter should be called *P. a. pacifica*." L.B.B.).

Limnodromus griseus scolopaceus Long-billed Dowitcher. Dowitchers are common during the spring and fall migrations, and a few adults remain during the summer. A few undoubtedly nest in the region although no nests have been reported. Murdoch collected a pair of belly-picked adults on June 28, 1883, which he took to be breeding birds. The majority of these birds nest to the eastward of the region under consideration, however, and in the late summer many birds of the year appear, feeding on the tundra close to the village. They were fairly plentiful near Wainwright, August 9-22, 1921. Brower secured a belly-picked adult at Barrow (C.A.S. 5157) June 13, 1931.

Ereunetes pusillus Semipalmated Sandpiper. This little shore bird is fairly common locally, but one may spend an entire season in a given region and not see one. A single specimen was collected at Wainwright, August 26, 1921, the only semi-palmated observed by Bailey and Hendee during that season. The following year they were fairly common about the village during the middle of August. Brower reports that there are two areas near Barrow where they may be seen, one, about five miles south of the village on a ridge between two rivers, and the other, on the high ground bordering the Chipp River. This is a favored locality of the black-bellied plover and the buff-breasted sandpiper.

Ereunetes maurii Western Sandpiper. This is merely a straggler along the northern coast, although occasionally a few breed; the main breeding ground is far to the south. Brower took two juvenile specimens, apparently male and

26. *Ibid.*,

27. *Ibid.*, 33.

female (L.B.B. 41344-5) August 24, 1927, and an adult with a set of three eggs on July 10, 1923.²⁸ Mr. R. M. Barnes reports a set of eggs and an adult taken by Mrs. Greist during the summer of 1931.

Tryngites subruficollis Buff-breasted Sandpiper. Murdoch reports this as a common form at Barrow during 1882-3, and collected eggs "in considerable abundance." This is another species which has probably become fewer in number, for while it occurs regularly, it must be considered rather rare in the area. In 1930 it was "fairly common," however, according to Brower, along the Chipp River, and he collected a set of four eggs (W. C. Hanna collection) with the adult (C. A. S. 5253). He also took a set of two on July 13, 1923, which are in the C.M.N.H. collection, and a set of four along the Chipp River, June 25, 1932 (Hanna collection). Hendee collected one of a pair seen at Wainwright August 11, 1921, and five on June 28 and 29, 1922. Brower was told by the reindeer herders that on two occasions they saw buff-breasted sandpipers incubating black-bellied plover's eggs, while the plovers stood near.

Limosa fedoa Marbled Godwit. This species is included in the list on the basis of a single specimen, a bird of the year, collected by McIlhenny on August 26, 1897.²⁹

Limosa lapponica baueri Pacific Godwit. This must be considered a rather rare species in the region, although it occurs regularly. There are several adults in the L. B. B. and C. A. S. collections, taken in June and July, and juveniles taken in August. The migration southward occurs about mid-August, and the only records for Wainwright were at this time,--birds of the year collected on August 11, 13, and 17, 1921, and August 13 and 16, 1922. The godwits are pugnacious fellows, and dart at the intruder in their nesting range; whenever jaegers, snowy owls, or other large birds come near, they are promptly put to flight. Bent³⁰ mentions that the young straggle northward after the breeding season, but the godwits appear to be regular breeding birds, for we have several records. A set of four eggs taken along the Meade River, June 20, 1932, is in the Hanna collection. The adult is C. A. S. 5839.

Limosa haemastila Hudsonian Godwit. The only specimens from the Barrow region are two obtained by McIlhenny, July 14, 1898. Stone describes them as follows: "they are slightly mottled with new gray feathers above and below, and show a number of pinfeathers beneath the plumage, but there is no indication of moult in the flight feathers."

Crocethia alba Sanderling. These shore birds occur regularly in spring and fall, but they are not common. Although they undoubtedly nest to the eastward of this region, they return on their fall flight by mid-August. Young of the year are seen at that time, and there are several in the L. B. B. collection (August 18, September 15). No nests have been found in the Barrow area. Murdoch failed to note the species in two years' stay at the station, and Bailey secured only a few during the fall of 1921 at Wainwright, and none in 1922. An adult male and female collected by Brower at Barrow June 5, 1928, (L.B.B. 42812-3) might suggest that the species breeds there.

²⁸. Ibid., 35.

²⁹. Stone, op. cit.

³⁰. A. C. Bent, Bull. U. S. Nat. Mus. 142, 294, 1917.

Eurynorhynchus pygmeus Spoon-bill Sandpiper. This straggler from Siberia is included in the North American list on the basis of one collected on the Choris Peninsula years ago and two specimens collected along Wainwright Inlet by Fred Granville, August 15, 1914.³¹ Considerable field work has been carried on at Wainwright since that time by Dixon, Bailey, and Hendee without other specimens being observed.

Phalaropus fulicarius Red Phalarope. This is a very common nesting bird of the region, the first arrivals appearing with the migrating ducks the latter part of May. They prefer rather long grass in moist areas of the tundra for nesting sites, and fresh eggs are found from June 20 to July 15. Young birds, with downy heads, but able to fly, are found in all the tundra pools by mid-August; they form flocks of several hundreds in the latter part of August, and feed along the sandy shores of lagoons and inlets. The adults seem to leave as soon as the young are able to shift for themselves, for few are seen after the first of September. The young, however, remain until the latter part of the month—the last to be noted at Wainwright in 1921 passed on September 28. It is not unusual, during the summer, to find flocks of adults, which are apparently non-breeding birds, and occasionally, a few in winter dress will be seen. Hendee collected two in this plumage, June 26, 1922, at Wainwright, and Brower took a few during 1930 at Barrow.

Lobipes lobates Northern Phalarope. These little phalaropes occur regularly in small numbers. Murdoch mentions this species as a "mere straggler," and its status is the same after fifty years. Bailey and Hendee collected two at Wainwright in the fall of 1921 (August 23), and Hendee saw two the next spring, (June 26—July 3). Brower has noted them nearly every year at Barrow, and collected a set of eggs in the summer of 1930, which are now in the collection of W. C. Hanna.

Stercorarius pomarinus Pomarine Jaeger. These large jaegers are common nesting birds of the region. They arrive the last week in May. Hendee reported them common at Wainwright early in June, over the lead, usually in pairs. On June 21, a few appeared to be located for breeding, and a nest with three eggs was found upon the tundra June 29.³² These "tundra hawks" are extremely predaceous, robbing other birds of their eggs and young at every opportunity. Brower relates that on one occasion a jaeger attacked a snowy owl, forcing it to the ground, and after swooping repeatedly, killed the owl. Brower has taken many specimens, and several sets of eggs the past few years.

Stercorarius parasiticus Parasitic Jaeger. These are common birds at Wainwright and Barrow. They arrive the latter part of May and nest commonly upon the tundra. They are undoubtedly responsible for many of the broken nests of eider and brant which are found from time to time. Both color phases are common, about one in three being of the dark phase. They leave for the south early in September, and the majority are gone by the middle of the month.

Stercorarius longicaudus Long-tailed Jaeger. This is usually a rather rare species at Barrow and the near vicinity, although it is more plentiful some seasons than others. During the fall of 1921, Bailey and Hendee did not record a specimen from Wainwright, and very few were seen the next season, the first being taken June 9. They nest, however, throughout the area.

31. Joseph Dixon, Auk, XXXV, 387, 1918.

32. Bailey, Condor, XXVII, 101, 1925.

Larus hyperboreus Glaucous Gull. This is a common bird during migration and the summer months. They arrive early with the first appearance of open water; Hendee reported his first glaucous gull on April 12. They nest rather sparingly along the shores of the large tundra ponds, and most of them leave for the south by the middle of September. There is a distinct gull migration each fall, and when this migration occurs, there is an apparently endless chain of birds straggling down the coast. The flight in 1922 occurred on September 16. Brower has collected a large series of gulls for Bishop and for the Chicago Academy of Sciences, and these specimens range from the immature to the fully adult birds.

Larus nelsoni Nelson's Gull. Stone recorded a male, taken by E. A. McIlhenny September 5, 1897 (P.A.N.S. 37692). Among the birds collected by Brower was one which Bishop identified as *nelsoni*. He concludes: "In adults, birds of this species differ from *hyperboreus* in the same manner as *kumlieni* does from *leucopterus* that is, by having a gray spot on the outer web of the second primary near the tip. In the first year young *kumlieni* differ from *leucopterus* by having the tail almost solid gray, instead of heavily spotted with white, as Dr. Dwight showed was the case in his paper on the white-winged gulls in the Auk some years ago. (How he made the error later in his 'Gulls of the World,' of calling this same bird the second winter plumage of *leucopterus* is hard to understand, as he knew perfectly that none of the white-tailed gulls have less white on the tails the second year than the first). A gull in the second year, but with the first-year tail unmoulted, collected at Barrow August 31, 1927 (L.B.B. 41313), differs from *hyperboreus* of similar age in just this manner, by having the tail almost solid gray instead of heavily spotted with white. It seems altogether probable this bird represents the hitherto unknown young of *Larus nelsoni*, and indicates it is a valid species." It will be noted that the new check list has placed this species in the hypothetical list, as it was considered a hybrid.

Larus leucopterus Iceland Gull. This species is added to the Barrow list on the basis of specimens in the L. B. Bishop collection and an immature in the collection of the C. A. S. Bishop writes: "A female gull in the third year, collected October 2, 1929, (L.B.B. 44240) is distinguishable from *leucopterus* from Greenland only by having a slightly larger bill, and must be called *leucopterus*. In my collection another Alaskan gull, an adult male, collected at Wainwright June 19, 1922, (40564), is the size and color of adult *leucopterus*, but has a slightly larger bill the shape of that of *hyperboreus*. Whether to call this bird *leucopterus*, a dwarf *hyperboreus*, or a hybrid between the two is problematical."

Larus kumlieni Kumlien's Gull. The first record for this species is given by Murdoch on the basis of a "dark and small immature bird" (U. S. Nat. Mus. No. 93306), which was identified by Mr. Ridgway, but the specimen has been re-examined and Dr. Wetmore states that it proves to be *Larus glaucescens*. There are, however, three young birds in the L.B.B. collection of which Bishop says:—"a male collected September 10, 1928, (42933), and a male and female collected October 8 and 16, 1929, (44241-2) are indistinguishable from first winter *kumlieni* in my collection from New Brunswick, except that two have slightly larger bills; while a female in the second year, collected September 10, 1929, (44239), agrees closely with a bird from New Brunswick which I believe is a second year *kumlieni*, and both differ from *leucopterus* in having a slightly brownish wash on the outer webs of the outer primaries,—a character to be expected in this species." The new check list places *kumlieni* in the hypothetical list, but we prefer to place it in its order, as we believe it distinct.

Larus glaucescens Glaucous-winged Gull. Murdoch collected and listed a "dark and small immature bird" (U. S. Nat. Mus. No. 93306) which was identified as *Larus kumlieni* by Mr. Ridgway. Dr. Alexander Wetmore had this specimen re-examined for us, and it proves to be *Larus glaucescens*, the only record we find from this area.

Larus schistisagus Slaty-backed Gull. One specimen, an immature bird, taken by Bailey and Hendee at Icy Cape, September 16, 1921, was identified by Bishop as this species. It is No. 9786 in the Colorado Museum of Natural History collection.

Larus argentatus smithsonianus Herring Gull. There are two specimens from Wainwright in the Colorado Museum of Natural History, one an adult male collected September 3, 1921, and the other an immature taken September 16, 1921. The adult male approached *vegae* in size. Three young were collected at Barrow by Brower on October 9, 1929, and September 9 and 29, 1931, (L.B.B. 44243 and 48390-1).

Larus argentatus thayeri Thayer's Gull. The first specimen recorded from the region was one taken at Icy Cape, September 16, 1921. It was an immature male. Additional specimens have been collected by Brower from time to time. There are ten in the L.B.B. collection—four juvenile females, four second year birds, a male in the third year, and a female in the fourth year and a young female taken September 24, 1931. There are also a half dozen immatures and a third year bird in the C.A.S. collection.

In comparing the plumage of the juveniles of *argentatus* and *smithsonianus* with *thayeri*, Bishop finds that the former have primaries and rectrices of clear, brownish black, becoming more brown through the winter; in *thayeri* these are dark hair brown in September, fading to light drab by March. In *argentatus* and *smithsonianus* the darker parts of the rest of the plumage are fuscus in September, becoming browner and paler through the winter; in *thayeri* the dark parts closely approach the hair brown of the wings and tail in September, and fade to light drab and drab-gray during the winter.

Larus canus brachyrhynchus Short-billed Gull. The first specimen recorded from the region was one taken by Bailey and Hendee at Wainwright, September 2, 1921 (C.M.N.H.) Brower collected two others, a young male September 1, 1928, and a juvenile female August 15, 1929, (L.B.B. 42755 and 46122).

Pagophila alba Ivory Gull. This beautiful species is a more or less regular visitor at Barrow in the fall, and occasionally in the spring. They appear offshore in October, working over the floes or following along the shore ice. Bailey saw several between Wainwright and Atanuk, October 24, 1922, and possibly 100 at Barrow October 30. The shore ice was freezing at this date (18° F below), and the birds were flying low over the "welling" slack ice. Hendee, the following season, reported the first, at Wainwright on May 18, over the whaling camp seven miles offshore. Brower states that the ivory gulls are most numerous during the westernly winds, and that at this time, the birds feed upon a "scum" on the water; their throats are usually full of this matter which stains their plumage.

Rissa tridactyla pollicaris Pacific Kittiwake. This species is common during the spring and fall migration. Murdoch apparently did not observe the species

during his two years' work. Bailey saw a few at Barrow August 8, 1921, and at Cape Halkett the 10th, and several hundred at Wainwright September 7. There was a migration southward on this date, when hundreds were flying offshore. Curiously enough, Hendee did not see a single bird at Wainwright in the early spring of 1922, the first being taken July 10. There are specimens in the L.B.B. and C.A.S. collections.

Rhodostethia rosea Ross Gull. These beautiful gulls seem to be extremely rare along the Alaskan coast, except near the northern point where they occur more or less regularly in October. They come in from offshore with the north-west winds, working south along the shore, and they are easily decoyed by a waving handkerchief; Brower has collected many specimens in recent years at Barrow, and Bailey secured a small series at Wainwright, one hundred miles down the coast. They occur only as stragglers in the spring when a few may be taken about the whaling camps. Murdoch reported the Ross gull common in the fall of 1881-2 and made extensive notes on their behavior. Bailey lists many fall records, and one, an adult, taken in the summer (July 24).

Xema sabini Sabine Gull. These gulls arrive along the northern coast the latter part of May, (Wainwright, May 28), and nest more or less commonly along the shore and upon small islands of tundra lakes. They appear irregular in their habits, however, as is true of many of the arctic birds, and they will be numerous one season, while only a few will be seen the next. The majority, young and adults, are well on their way south the third week in September.

Sterna paradisaea Arctic Tern. These beautiful little sea birds do not arrive along the Arctic coast until June, as a rule, and they go directly to their breeding grounds—sandy islands of the big lagoons, or on the deltas built up by tundra streams. They leave early in the fall, the bulk of them disappearing by the first week of September. Murdoch reported no terns after August 10. Bailey noted the main migration at Icy Cape September 7. He observed, "many large flocks were composed almost entirely of young terns, although an adult usually accompanied them. They often hovered overhead, the whole flock poised with forked tails spread, complaining in the usual querulous, tern-like fashion. Many flocks stopped to rest on the sand beaches, a prolonged flight, doubtless, being too much for their untried wings."³³ Brower reports fresh eggs from June 27 to July 7.

Uria lomvia arra Pallas' Murre. This is a common form during the spring and fall migration. Hendee reported them extremely abundant, flying in flocks of hundreds, on May 9 and 10, 1922, there being no lead of open water at the time. The flight continued for several days, whenever the wind was from the south, or when it was calm.³⁴ They usually appear at Barrow after the main flight of eiders has passed. Murdoch reports them as rare stragglers, but it is necessary to go offshore to observe the migration of many waterfowl, so he probably missed the big flight. He reports one late record, a specimen taken by seal hunters, December 9, 1882. Stone called the seventeen specimens taken by McIlhenny, *lomvia*, but the measurements of the wings average nearer the western rather than the eastern form. The new check list mentions *arra* as being "casual at Point Barrow," but the form occurs regularly, and not uncommonly.

33. *Ibid.*, 107.

34. *Ibid.*, 66.



SNOWY OWL

Cepphus grylle mandti Mandt's Guillemot. This is a common form in winter, where there is open water. The Eskimos claim that the birds live under the ice, just as do the seals, getting their air from under pressure ridges. Mr. Brower relates that on one occasion, while watching at a seal hole with apparently no open water near for miles, he was surprised to have a guillemot bob to the surface. There are two juveniles, two yearling males and four adults in the L.B.B. collection, and several others from Barrow in the collection of the Academy.

Brachyramphus brevirostris Kittlitz Murrelet. The first records from this region were two taken by R. W. Hendee at Wainwright on June 9, 1922. They were in an open lead in the ice pack. The natives had a name for the birds—"ig-ir-ook"—although many of the old hunters did not know them. Specimens have been taken the past few years in the late summer and fall months, some from the drift right at the Point. There are seven adults in the L.B.B. and four in the C.A.S. collection, which were taken between August and October.

Aethia cristatella Crested Auklet. These little divers are wanderers that have come north after the breeding season, for they appear offshore in small numbers in late summer. Specimens have been taken in the last few years, and several are in the L.B.B. and C.A.S. collections.

Aethia pusilla Least Auklet. The least auklets are rare stragglers along the northern coast in the late summer. The first was taken by E. A. McIlhenny, August 30, 1897, ³⁵ a second specimen was collected by Brower October 11, 1925, and another by J. A. Allen, on the same date, from Wainwright, one hundred miles down the coast. Others were taken at Barrow August 16, 1930 and September 25 and 30, 1931. All the birds were found where there were scattering ice fields.

Bubo virginianus algistus St. Michael Horned Owl. An occasional horned owl wanders from the woods of the interior to the tundra country. The only record we have from the area is a large specimen, probably a female, found dead upon the tundra thirty miles from Barrow, November 14, 1929, (L.B.B. 45818).

Nyctea nyctea Snowy Owl. This is usually a common bird throughout the arctic, but there are years when few are seen. When lemming are abundant, the owls will be very common and nest abundantly, but when lemming are few in number, the birds will be scarce. The owls are resident the year around, and nest on tundra knolls.

Asio flammeus Short-eared Owl. This is a common form on the tundra, back from the coast, but Brower has succeeded in finding only one nest. The numbers of birds fluctuate with the abundance of lemming; if the small mammals are plentiful, there are sure to be many short-eared owls. There are several specimens from the area in the L.B.B., the C.M.N.H. and the C.A.S. collections, and a set of four eggs taken along the Tuparrow River on June 25, 1932, in the Hanna collection.

Colaptes auratus luteus Northern Flicker. The natives claim that these birds are not uncommon along the wooded valleys near the foothills, but we have only two definite records. The first was recorded in the Condor ³⁶ as *Colaptes auratus borealis*, a specimen taken at Wainwright in 1924 by C. M. Andrews (adult female, Mus. Vert. Zool., No. 45092), while the second was a young female collected at Cape Halkett in the fall of 1927, (L.B.B. 42959).

Tyrannus tyrannus Eastern Kingbird. Another visitor was secured far out of its range when a native caught an adult female near the village on June 17, 1931 (C.A.S. 5255).

Sayornis saya saya Say's Phoebe. The first record we have for this bird for the area is an unsexed adult (C.A.S. 5805), taken by Brower at Barrow, May 27, 1932.

Myiochanes richardsoni richardsoni Western Wood Peewee. A single specimen has been taken at Barrow. Stone records that "one female, secured July 1, 1898, materially extends the northward distribution of the species. The bird is interesting as it is renewing the outermost primaries of the left wing, which had evidently been accidentally lost. Instances of renewal of retrices are common, but this is the first instance that has come to my notice, of the renewal of a remex."

Otocoris alpestris arcticola Pallid Horned Lark. The only one recorded from the region is an adult female (L.B.B. 42835), collected by Brower, May 31, 1928.

35. Stone, op. cit.

36. Bailey, Condor, XXVII, 126, 1925.

Tachycineta thalassina lepida Violet-green Swallow. Brower obtained one in juvenal plumage, August 26, 1929 (L.B.B. 46156).

Iridoprocne bicolor Tree Swallow. Brower collected an immature August 26, 1929 (C.A.S. 2400).

Riparia riparia riparia Bank Swallow. This is an irregular visitor to the Barrow region, usually in the fall, after the breeding season. Murdoch observed a few swallows during the summer and fall months, but failed to collect specimens, other than one which was found dead. Hendee observed a flock of seven at Wainwright, August 10, 1922, but he also was unable to collect one, so the record is open to doubt, as swallows are difficult to identify on the wing. Brower secured one in juvenal plumage, August 26, 1929, (L.B.B. 46157). It will be noted that he collected three species of swallows on this date.

Riparia riparia ijimae Siberian Bank Swallow. This record for North America is based upon an immature collected by Brower, September 15, 1928. The specimen (C.A.S. 2100) was submitted to the late Mr. Outram Bangs for identification, and he compared it with specimens in the Museum of Comparative Zoology. He writes—"it exactly matches *Riparia riparia ijimae* (Lönnerberg) of Sakhalina Island and east Siberia, of which we have plenty of skins. It is much darker than any specimens we have of *riparia riparia* from anywhere here in the east. The question, then, naturally comes,—is it a stray migrant of *ijimae*, as is perfectly likely, or is it an exceptional variant of *riparia*? I can assure you it is an exact match for *ijimae*, and I believe it is an example of that form." ³⁷

Hirundo erythrogaster Barn Swallow. This is a rare and irregular visitor to the Barrow region, and Brower has observed it only a few times. He collected two specimens (L.B.B. 43836 and 45826), an adult male and female, secured July 1, 1929 and June 4, 1930. Another adult male was taken in July, 1931 (C.A.S. 5254).

Corvus corax principalis Northern Raven. This species has not been taken on the coast, but Brower obtained a specimen from along the Meade River. It was an adult female (L.B.B. 42960), and was collected September 10, 1928. This species prefers abrupt cliffs to low tundra, and is fairly common near Cape Beaufort and Cape Lisburne, some hundred miles below the limit of the Barrow area.

Nannus hiemalis pacificus Western Winter Wren. A specimen, found dead, was secured by Brower, October 5, 1929 (L.B.B. 44274).

Turdus migratorius migratorius Eastern Robin. Another wanderer was obtained when an Eskimo boy caught an adult male of this species on May 14, 1930 (L.B.B. 45828). It was first seen out on the sea ice, and it was very tame. The tundra was covered with snow. Another was taken during the summer of 1931, which was preserved by Mrs. Henry Greist during Mr. Brower's absence (C.A.S. 5238).

Hylocichla minima aliciae Gray-checked Thrush. The McIlhenny expedition secured two specimens, an adult male from near Point Tangent, May 27, 1896, and one near Barrow June 10. Brower took two specimens from near

³⁷ Bailey, Auk, XLVI, 550, 1929.

Barrow, an adult male, September 1, 1928 (L.B.B. 42849), and a young bird, August 29, 1929 (L.B.B. 46159). This young bird is as small as average specimens of *Hylocichla minima minima*, with an even shorter tail.

Sialia currucoides Mountain Bluebird. Brower took two adult females at Barrow, June 5, 1930 (C.A.S. 4400 and L.B.B. 45831). They are the only records we find for the region.

Oenanthe oenanthe oenanthe Wheatear. This species is an irregular visitor, being seen more or less commonly one season, while few will be observed the next. They were numerous upon the tundra in the spring migration of 1882, but none was observed in 1883.³⁸ They are present in both the spring and fall, but have not been recorded as breeding in the area. Bailey and Hendee secured several specimens at Wainwright the third week of August, 1921, and Brower has taken a half dozen or more within the past few years, which are in the L.B.B. and C.A.S. collections.

Cyanosylvia suecica Red-spotted Bluethroat. The first specimen of this beautiful little bird, an adult male, was secured May 30, 1926, (C.A.S. 5122) at Barrow by Brower, and an adult female (L.B.B. 42964) was collected with a set of five eggs (L.B.B. set 3582), on the Meade River about thirty miles inland, in July, 1928. Two additional specimens, females (C.A.S. 5791-2) were secured on June 18, 1932 along the Meade River with their eggs (both sets of six each are in the Hanna collection) and a female (C.A.S. 5897) with eggs from the same locality, June 20, 1932. The eggs are in the Academy collection.

Acanthopneuste borealis kennicottii Kennicott's Willow Warbler. Hendee secured a specimen which was picked up dead, about June 20, 1922, at Icy Cape, and Brower secured an adult female at Barrow, July 9, 1932 (C.A.S. 5827).

Corthylio calendula calendula Ruby-crowned Kinglet. Brower secured an adult male from Cape Halkett, during the fall of 1921, (C.M.N.H.) and another adult male at Barrow, April 30, 1932 (L.B.B. 48914). The natives report the species not uncommon inland, where it breeds among the willows. The specimen is in the C.M.N.H. collection.

Motacilla flava alascensis Alaska Yellow Wagtail. This is another species which is rare along the coast, but which is not uncommon along the willow-grown valleys of the interior. Three were taken by the McIlhenny expedition, an adult male, June 12, 1898, and two young, August 8, 1898. An adult female (L.B.B. 42963) was taken with a set of five eggs (L.B.B. 3581), along the Meade River in July, 1928, and five others were collected from June 21 to 25 (L.B.B. 48912-3; C.A.S. 5824-5-6), with four sets of five eggs each, now in the Hanna collection.

Anthus spinoletta rubescens American Pipit. Hendee collected a specimen at Wainwright September 28, 1921,³⁹ and Brower secured a specimen (C.A.S. 5825) from along the Meade River June 20, 1932. Two sets of eggs were secured—one of four, June 29, and the other of six on June 25 (Hanna collection).

Vermivora celata celata Orange-crowned Warbler. An adult male was secured by Brower, inland from the village of Barrow, June 5, 1928 (L.B.B. 42848).

38. John Murdoch, Rep. International Polar Expedition 1885.

39. A. M. Bailey, Condor, XXVIII, 170, 1926.

Dendroica aestiva rubiginosa Alaska Yellow Warbler. Hendee saw one of this species at Wainwright, August 17, 1921, and a native brought a specimen to Bailey from Icy Cape, October 8, 1921. The tundra had been snow-covered for weeks and the specimen was extremely emaciated, although in fine feather.

Dendroica coronata Myrtle Warbler. This is another straggler within the region. Brower secured an adult male June 4, 1930 (L.B.B. 45827). The McIlhenny expedition took a single specimen, a male, at Point Tangent, June 3, 1898 (P.A.N.S. 37483). ⁴⁰

Wilsonia pusilla pileolata Northern Pileolated Warbler. Brower has taken three specimens in the past few years, an adult male, September, 1928 (C. A. S. 2093), from along the Meade River and two young birds found dead during the same month (L.B.B. 42965 and 46158). It is probable that many small perching birds range north of the Endicotts, along the willow grown valleys, well into the area under consideration. There has been so little field work that many of these forms, which we call "mere stragglers," may prove on further work to be fairly common.

Oporornis tolmiei Macgillivray's Warbler. Among the specimens secured by Brower from along one of the rivers, a short distance inland from Barrow, was a fine adult male (C.A.S. 2099), on September 12, 1928.

Euphagus carolinus Rusty Blackbird. This species occurs occasionally, and several have been taken near the village of Barrow; Brower states that they are not uncommon near Cape Halkett, where they follow the reindeer herds. The first specimen secured by Brower (C.M.N.H. 10904) was taken in July, 1924, at Barrow. Another, (C.A.S. 2401), an adult male was secured September 29, 1929, and two others, an adult and a young male were collected July 1, 1929 and October 1, 1929 (L.B.B. 43835 and 44270). The last observed was an adult male taken at Barrow, May 24, 1932, (C.A.S. 5482).

Acanthis hornemanni exillipes Hoary Redpoll. This is not a rare bird in the region. Murdoch reported a few about the village of Barrow and secured a set of three eggs. Brower has collected several in the past few years and observed them about the village each season; a pair nested under the walk near his station, and another pair had their nest on a boat rack. There are specimens collected by Brower in the L.B.B. and the C.A.S. collections. Several sets of eggs with the adults were collected in the willows along the Meade River in June, 1932. Specimens are in the Bishop and Hanna collections.

Acanthis linaria linaria Common Redpoll. This form which was first observed by Nelson is uncommon within the region. Murdoch and McIlhenny failed to record it. Hendee collected two specimens at Wainwright, June 13, 1922 (C.M.N.H. 9410 and 9414) and reported them numerous in small flocks, between June 17 and 24.

Passerculus sandwichensis alaudinus Western Savannah Sparrow. Brower secured an adult female from near Dease Inlet (L.B.B. 42845) June 30, 1928. Five breeding birds were taken along the Meade River in June, 1932 (L.B.B. 48909-10; C.A.S. 5801-2 and 5896). Four sets of eggs are in the Hanna collection and two in the Chicago Academy of Sciences.

⁴⁰ Stone, op. cit.

Passerculus sandwichensis sandwichensis Aleutian Savannah Sparrow. The only record for the region is an adult collected at Wainwright by Bailey and Hendee, October 5, 1921; snow covered the tundra to such a depth that the grass seeds and willow twigs were barely exposed. ⁴¹

Junco hyemalis hyemalis Slate-colored Junco. This little sparrow is a regular but uncommon visitor to the region. Murdoch took a male at Barrow, on May 24, 1883, and Bailey collected another male on September 16, 1921, at Wainwright. Brower has taken a few specimens, four of which are in the L.B.B. collection, an adult female, collected June 6, 1928, two unsexed young, September 17 and 30, 1929, and an adult male, June 9, 1930. "These birds although not typical, are nearer to *hyemalis* than to other races described" (Bishop).

Spizella arborea ochracea Western Tree Sparrow. The Barrow region is within the breeding range of this bird, but it is a rare species. Brower secured an adult (L.B.B. 42962) with four eggs (L.B.B. 3580) from along the Meade River in July, 1928. He secured three other specimens, two females and a male, June 9, 1932 (L.B.B. 48911; C.A.S. 5793-4).

Spizella passerina arizonae Western Chipping Sparrow. There is only one record, so far as we know, for this species. Brower secured a young male (?) at Barrow, September 18, 1929 (L.B.B. 44273).

Zonotrichia leucophrys gambeli Gambel's Sparrow. Murdoch took a young of the year on September 14, 1883, at Barrow, which he listed under *intermedia*, (U. S. Nat. Mus. No. 93131) and McIlhenny collected a female June 18, 1898, which Stone recorded as *nuttalli* (P.A.N.S. 37484). Hendee took two specimens at Wainwright, May 29, 1922, and Brower took an adult female at Barrow June 6, 1928 (L.B.B. 42846). He secured another (C.A.S. 5803) June 9, 1932. An adult male (L.B.B. 45824) collected May 14, 1930 is apparently an intergrade.

Passerella iliaca iliaca Eastern Fox Sparrow. The only record we have for the region is a female taken at Wainwright by Bailey and Hendee, on September 30, 1921. ⁴²

Calcarius lapponicus alascensis Alaskan Longspur. Longspurs are very common upon the tundra. They do not arrive as early as the snow buntings, the majority appearing about the third week in May. The nests are depressions in the moss, lined with reindeer hair and an occasional ptarmigan feather, and five or six eggs make up the usual set. Many begin their fall moult the first week in July, and are in poor feather by the first week in August. The longspurs migrate south before the snowflakes, and few will be seen after September 1.

Calcarius pictus Smith's Longspur. McIlhenny secured a male, June 11, 1898, which was recorded by Stone.

Plectrophenax nivalis nivalis Eastern Snow Bunting. This beautiful little sparrow is a common bird throughout the area. The first arrivals often appear on the snow-covered tundra early in April (April 9, 1882--April 11, 1922), but the majority do not appear until about the middle of May. They scatter over the

⁴¹ Bailey, Condor, XXVIII, 168.

⁴² Ibid., 169.

tundra, nesting under boulders or in sheltered places along cut banks. Often they nest about the houses, in the cornices of the buildings, on caches, or in bird boxes erected for them. Young are hatched by the first week in July, and fully fledged fellows are seen on the wing by the first of August. Then, when the gray skies of September come around, the snowflakes begin their autumn trek and gradually disappear; few will be seen by September 20. The last recorded in 1921 at Wainwright was on October 5th. The ice was a foot thick on the tundra ponds at this date.

Photographs by Alfred M. Bailey, used through the courtesy of the Colorado Museum of Natural History. Map drawn by Mary Cooper.

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REVIEW OF THE ANNUAL MEETING

The seventy-sixth Annual Meeting of the Academy was held in the lecture hall on Monday evening, April tenth. The President, Dr. Henry C. Cowles, being detained in the south, the chair was occupied by Mr. F. R. Dickinson, Vice-President. Dr. Nathan S. Davis, Secretary, read a brief account of the activities of our organization during the past year, noting that in spite of reduced income, the Academy has been able to serve the public as it has in the past. The Treasurer of the Academy, Mr. Austin J. Lindstrom, commented briefly on our financial condition, and stated that we have lived within our income, and that it is the policy of the Board of Trustees to continue doing so. Mr. A. M. Bailey, Director, gave his annual report upon the work accomplished by the officers, honorary curators, and staff during the past year.

The address of the evening was given by Mr. Richard Finnie, under the title of "Life Among the Copper Eskimos." The lecturer gave an interesting account of a flight over the magnetic pole and of his experiences among the primitive natives of the north.

It is felt that the following paper devoted to the mushrooms of this area, will prove of value to all who delight in roaming over the woodlands of Illinois. The author, Dr. Verne O. Graham, is a Scientific Governor of the Academy and president of the Conservation Council. His paper is presented as a joint contribution from the Academy and the Illinois Audubon Society.

THE MUSHROOMS OF THE CHICAGO REGION

V. O. Graham, Ph. D.

Thousands of people are interested in mushrooms, but few have any accurate information concerning them. This is not because they have not desired to know, but because no popular account has been written covering the mushrooms of the Chicago region. It is hoped that this little paper will be welcome and helpful to many people who have long wished for an opportunity to acquaint themselves with these queer plants.

In this brief account the uncommon fungi are not treated. I hope that the diligent searcher, who is ever alert for new forms, will not expect this pamphlet to identify all species that he sees, for only about one hundred out of over seven hundred mushrooms found in the Chicago area, are listed here.

The ever-present rules for telling whether mushrooms are edible or poisonous are worse than useless, because they usually prove misleading. The only safe procedure is to know the mushrooms which you intend to eat. Space in this brief article is not sufficient for the inclusion of a discussion of the rules

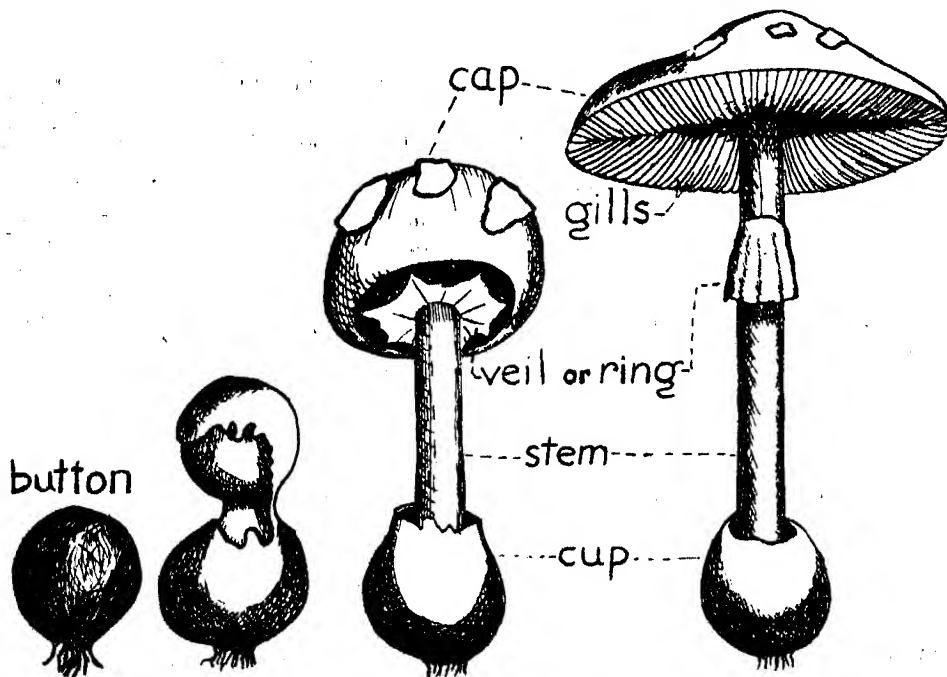


FIG 1 DEVELOPMENT OF A MUSHROOM

The young button stage of a mushroom looks like a small puff ball. It has a covering layer, a short stem and the gills of the cap within. The button stage enlarges and elongates upward, eventually breaking the outer layer. Part of this layer becomes a cup about the base of the stem; part becomes patches on the cap. The gills are covered by a thin veil, which, if it breaks away from the margin of the cap, will fall to the stem, forming a ring. If it breaks away from the stem, it hangs in fragments from the margin of the cap and leaves the stem without a ring.

In many cases the outer layer of the button stage breaks very low and no cup remains at the stem base. In other cases, the outer layer is so soft that it disappears quickly. Similarly, the veil, which covers the gills, may be so thin and delicate that none remains when the cap expands.

In the dissemination of mushrooms, spores fill the same role as seeds in the flowering plants. Spores are produced on the sides of gills, or on the pore walls, in the gilled mushrooms and pore fungi, respectively. Spores are much smaller than dust particles and may be carried on air currents for many thousands of miles. The mold-like network (mycelium) is the vegetative part of the fungus and the mushroom is the fruiting body,

used, but every one of them has been proven of no value. Such tests as "peels," "blackens a quarter when cooked with it," "the spinach leaf test," etc., are of no value.

Many use the word "toadstool" in speaking of mushrooms. To some people the word is synonymous with mushroom, to others it means poisonous mushroom, and to many it means a mushroom with a central-stemmed circular cap; therefore, it is well not to use the term.

Spore prints are frequently necessary when accuracy of identification is desired. The color of the gills does not always indicate the spore color, for the smooth lepiota has pink gills but white spores, and the purple-gilled clitocybe has white spores. Colored spores, however, usually change the color of the gills. A spore print may be made by placing a mushroom cap on a piece of paper with the gills down, and placing an inverted water glass over it to prevent air currents from removing the spores. In an hour a good spore print will be on the paper. Some prefer part of the cap to be on black paper and part on white; this brings out the white prints on the black background. To save time in the field, caps may be enclosed and prints obtained in envelopes.

More cases of poisoning from mushrooms have been reported from the sand dunes than from all other parts of the Chicago area combined. Sand is the best habitat for the death-cup mushrooms. One accustomed to indiscriminate collecting in this sandy area will certainly, at some time, include in his collection specimens of this deadly plant. It is suggested that the person who prefers wild mushrooms in his diet, should become well acquainted with a few edible species and eat them only, until his knowledge makes it possible for him to add a few more to his quota of selected kinds.

Any rich woods where moisture is plentiful will produce abundant mushrooms. In the north shore ravines and their shaded slopes, the protected woods to our west, the forest preserves about Thornton, and in forests of the dune area mushrooms are abundant. Poisonous species are rare in the habitats outside of the dunes.

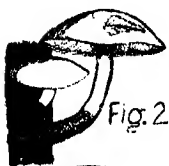
In many cases the description of a group is included in the description of the first species of the genus.

Those desiring additional and more technical information are referred to the following

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| Burt, E. A. | The North American Species of Clavaria. Missouri Botanical Gardens. St. Louis, 1922. |
| Kauffman, C. H. | The Agaricaceae (Gilled Mushrooms) of Michigan. Michigan Geological and Biological Survey. Lansing, 1918. |
| Krieger, Louis C. | Common Mushrooms of the United States. National Geographic Magazine, XXXVII, 388-439, May, 1920. |
| Moffatt, W. S. | The Higher Fungi of the Chicago Region. Pt. 1., The Hymenomycetes. Pt. 2., The Gastromycetes (<i>sic</i>). The Chicago Academy of Sciences. Chicago, 1909 and 1923. |
| Seaver, Fred Jay | The North American Cup-fungi. Published by the Author. New York, 1928. |
| Thomas, W. S. | Field Book of Common Gilled Mushrooms. G. P. Putnam's Sons. New York, 1928. |

Descriptions of the major groups of mushrooms

Mushrooms are grouped into families according to the nature of the surface on which spores are borne. This surface is usually an under-surface.



The GILLED MUSHROOMS, family Agaricaceae, are familiar to everyone. They have radiating plates on the underside; practically all of them are of the central-stemmed cap type. Because this family contains a greater number of mushrooms than all the other families combined, a key to the genera is included as Fig. 9.



The PORE MUSHROOMS are separated into two families,—Boletaceae and Polyporaceae, which have tiny holes, tubes, or pores on the lower surface. The former has a circular cap on a central stem and looks very much like the gilled mushrooms, except for the pore surface, which is easily separated from the cap. The Polyporaceae are mostly shelf-like forms, although a few are central-stemmed. Some are woody, others tough and leathery, and still others, at least when young, soft and fleshy. The soft species are edible.



The CORAL MUSHROOMS, family Clavariaceae, are club-shaped, or branched like reindeer horns. Some of them are quite beautiful. They are white or yellow, and all those found near Chicago are edible.



THE SMOOTH PORE SURFACE MUSHROOMS, family Thelephoraceae, have various forms; some are branched like reindeer horns, others are shelf-like, and still others grow like a thin membrane glued against a log or stump. The only common local terrestrial species, *Thelephora schweinitzii*, looks very much like the corals.



TEETH MUSHROOMS, family Hydnaceae, are covered with short needle-like projections which sometimes resembles shaggy hair. Some are central-stemmed, many are not.



PUFF BALLS, order Gasteromycetes, enclose the spores within a ball-shaped form during the young and maturing stages. The true puff balls break open at the top so that the spores may escape; the stink horns, a peculiar adaptation of the puff balls, mature the spore mass within a round puff-ball-like form, which, upon maturation of the spores, breaks and grows a long stem bearing the spore mass near the top.

All of the above mentioned families are known as club fungi because they produce their spores on minute clubs. Another group of mushroom families produces the spores in minute sacks. These are called sac fungi and include the cup, sponge, and side-saddle mushrooms. Since these families are relatively poor in species, and only the morel is well known, no specific family descriptions are offered.

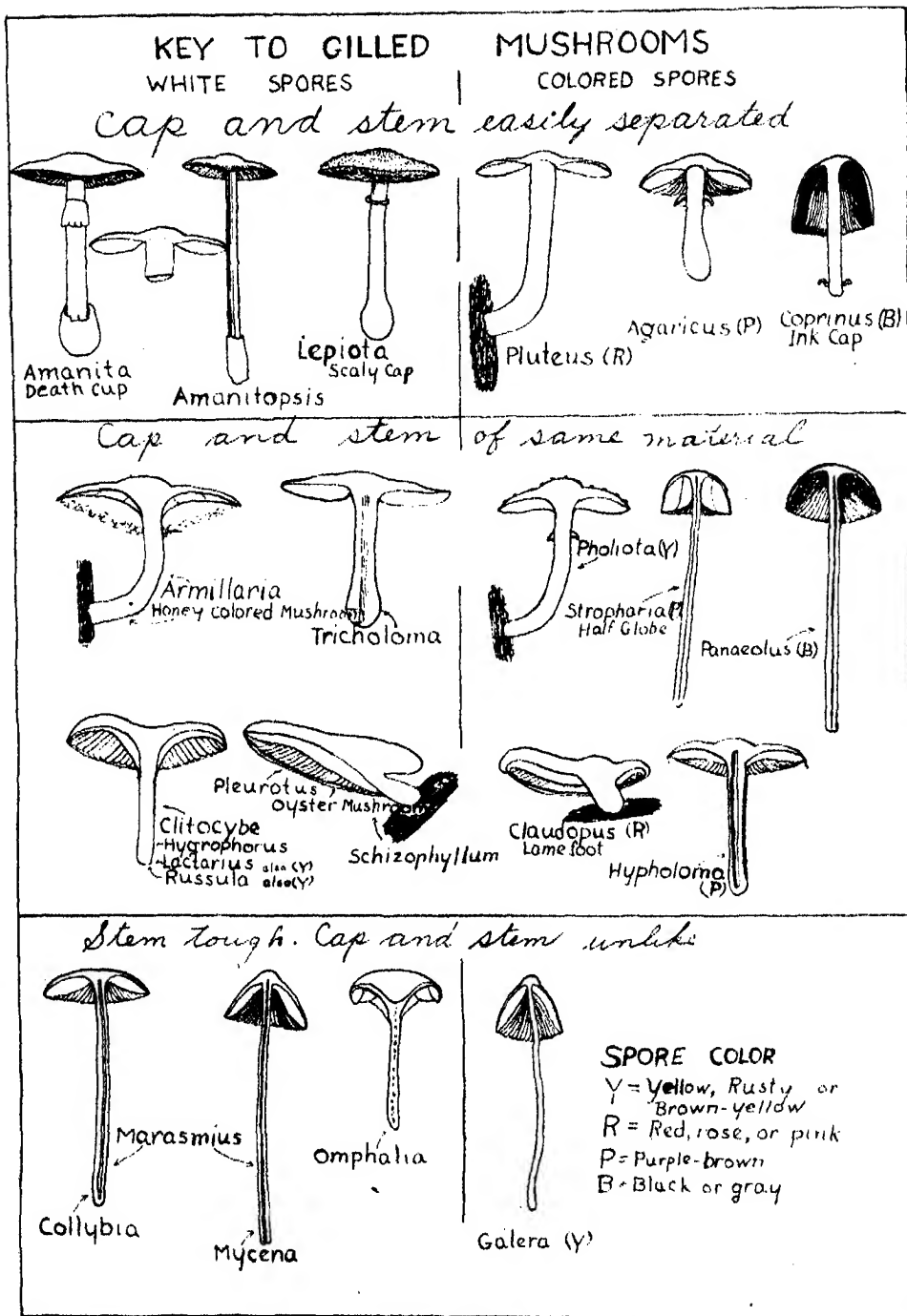


FIG. 9. KEY TO THE GILLED MUSHROOMS

The key works in rows across the page and in columns from top to bottom of the page. The top row across the page contains all gilled mushrooms which have the cap and stem separating easily. In these species the gills do not touch the stem.

The second row contains the mushrooms which have the cap and stem of the same material. The cap shape merges gradually into the stem. The gills are attached to the stem, and sometimes down the stem.

The third row has tough stems of different material from the cap. The stem is not easily detached from the cap, as is true of the top row. Nearly all mushrooms of this row are small.

The columns are according to spore color. In some cases a spore print is necessary to determine the color.

THE GILLED MUSHROOMS

The DEADLY AMANITA or DEATH-CUP (*Amanita phalloides* and *Amanita verna*). (fig. 10). The Amanitas or death-cups are known by a skirt-like ring around the stem, and a cup, either membranous or heavier, into which the stem base fits. The very deadly mushrooms are in this group.

The death-cup is the most poisonous of all our mushrooms, yet, due to its attractive appearance, it has often been picked in preference to other kinds. Records show that if this species makes up a considerable portion of the meal, death will result. About six hours after eating, sickness begins; abdominal cramps occur at intervals of a few hours and increase in severity. After three or four days of intense suffering, accompanied by great pallor and weakness, the patient either is relieved by death or begins a gradual improvement. *Amanita verna* is pure white; *phalloides* may be smoky, olive, or a dull yellow. These plants, growing to a height of from five to ten inches, are found in black oak or chestnut woods (or woods of equal soil moisture) from May to October.



Fig. 10 The deadly amanita.

Those who would pick wild mushrooms for the table should remember the following five points about the poisonous death-cup:

- a. It grows singly, not in clusters.
- b. It has white gills.
- c. It grows on the ground not on wood.
- d. It has a skirt-like, membranous ring around the stem.
- e. It has a cup, usually membranous but sometimes quite firm, into which the stem base fits.

The FLY MUSHROOM or FLY AMANITA (*Amanita muscaria*) (fig. 11) has a cap of orange yellow, with white, cottony patches scattered over the upper sur-

face. It has a short, skirt-like ring around the stem, and white gills. The basal cup is composed of material so soft that it is usually broken into patches about the bulb at the base of the stem. This plant prefers sandy soil, but may be found in the black oak woods on clay soil. It occurs from July to October, and is usually about four inches high, although it may reach a height of twelve inches and a diameter of ten inches, during August, on sandy soil where quaking aspens grow.

Muscarine is the active poison of the fly amanita, and causes paralysis of nerve centers. It acts almost immediately after being eaten, and should it paralyze centers which control vital functions, death follows. Our ancestors made use of the poisonous qualities of this mushroom by placing small pieces of it in a saucer, with a small quantity of water; flies sipping this liquid were immediately killed. Siberians concoct a drink of this species in whortleberry juice which produces an effect of intoxication accompanied by remarkable dreams.

The SHEATHED AMANITOPSIS (*Amanitopsis vaginata*) is common in woods from June to October. It resembles the death-cups but does not have a ring around the stem. The cap is thin and the lines on its margin add much to its beauty. The color is various—dark gray, white, or orange-brown. It is edible.

The SMOOTH LEPIOTA (*Lepiota naucina*). The scaly caps or lepiotas may be recognized by the collar-like ring around the stem and the absence of the cup at the base. All common lepiotas, except the pure white, smooth lepiota, have scales on the cap. All have white spores except Morgan's lepiota which has green ones, and is the only non-edible form.

The smooth lepiota is entirely white, with gills commonly tinted pink in old specimens. This plant looks like the deadly amanita, but close examination reveals a ring which stands out horizontally from the stem instead of hanging down like a skirt, and a rounded bulb instead of a cup at the base of the stem. This mushroom, which is edible, is commonly found growing in grassy places in our parks from June to October.

The TALL LEPIOTA (*Lepiota procera*) (fig. 12) is a stately plant, commonly eight inches high, with a white cap covered with light brown scales. The stem is closely flecked with brown patches, and the ring, which stands out at right angles, becomes detached and movable. The center of the cap is raised dome-like, forming an umbo. It is found occasionally in open woods from July to September. All efforts to cultivate this delicious mushroom have failed.

MORGAN'S or GREEN-GILLED LEPIOTA (*Lepiota morgani*) has the aspect of a large horse mushroom (meadow agaricus, *Agaricus arvensis*). Experiences of different people indicate that this mushroom is poisonous when eaten raw; when well cooked, it has been eaten without ill effects. It is a very large white plant, attaining a diameter of ten inches. Its cap is at first shaped like a half globe which later expands; the ring is thick, and like the other lepiotas, is at right angles to the stem. The gills are usually tinted from the spores. Although not as numerous about Chicago as formerly, the green-gilled lepiota is still fairly common in meadows, sometimes in fairy rings, from August to October. It should be avoided and carefully differentiated from the horse mushroom.

The FAWN-COLORED PLUTEUS (*Pluteus cervinus*) is a splendid mushroom for the table. It is very common on logs, stumps, and sawdust, from May until November. The stem is often curved when the mushroom grows from the side of

a stump, and is quite firm and always marked with dark, fibrillose streaks. The gills are soon tinted pink from the spores. This fungus is rather large, varying from two to five inches across, with a somewhat nutty taste when cooked, and quite bitter when raw. All wood-growing mushrooms except the deceiving clitocybe are non-poisonous.

The COMMERCIAL MUSHROOM (*Agaricus campestris*) is too well known from stores and golf courses to need much of a description. A young cap when broken in two shows pink gills; older ones have brown or brownish-purple gills exposed. They vary from white to scaly, streaked with dark brown; a collar-like ring is commonly seen on the stem. This plant is easily cultivated, and has a splendid flavor. All members of this genus are edible. (fig. 36)

The HORSE MUSHROOM or FIELD AGARICUS (*Agaricus arvensis*) is two or three times as large as the commercial mushroom, and is common in meadows and around old hay stacks from July to October. The cap is scaly brown, the gills, at first are white, but soon change to brown or purplish-brown from the spores. The ring around the stem is rather firm and heavy. This is a plant of fine flavor, but be careful that you do not mistake Morgan's lepiota for it.

In the woods grows another splendid species which looks something like the horse mushroom, but quickly turns red where bruised. This is the red-stained agaricus (*Agaricus haemorrhodaria*), which is also edible.

The COMMON INK CAP (*Coprinus micaceus*) derives its name, as the other mushrooms in its group, from the fact that as the spores mature, the cap gradually changes to a watery substance which is colored black by the spores and resembles ink. The three species of ink-caps are all edible and quite abundant. The common ink-cap, which is dull yellow, grows everywhere — under trees along the street, in lawns, and in pastures. It is usually about an inch broad, and somewhat higher, and has a very good flavor. It is found from April to November.

The THICK INK CAP (*Coprinus atramentarius*) is gray without yellow tints. The cap is from one to three inches across, while the plant is from two to four inches high. It is common around stumps in open woods from May to October. It should not be eaten raw.

The SHAGGY MANE (*Coprinus comatus*) (fig. 13) has large, loose, dark, outward curving scales on the cap, which give it its name. This mushroom grows up to eight inches in height, and the long, dome-like cap may be five inches long and one and one-half in diameter. It occurs in grassy lawns during September, occasionally in May or June, and is edible and very tender.

The HONEY-COLORED MUSHROOM (*Armillaria mellea*) (fig. 14) is a deadly parasite on oak trees; fortunately, however, it is a very fine mushroom for the table, and in the Chicago vicinity is probably eaten more than any other wild mushroom. The cap, one to three inches across, is of a dull brownish yellow, about the color of honey, often decorated with tiny black points. The gills are covered with a membrane or a cobwebby veil which, when broken, forms a ring around the stem. The stem may be straight or curved, depending on the growing position of the plant. Rows of honey-colored mushrooms may be seen radiating outward from the base of an oak tree from whose roots they derive their nourishment. It is found from the middle of September to November.

The DECEIVING MUSHROOM or JACK O'LANTERN (*Clitocybe illudens*) is a large, brilliantly colored orange-yellow mushroom which grows in dense clusters around old stumps in the woods. It grows to ten inches in height and eight inches across. Like all the mushrooms in the second row of the key, the Jack O'Lantern has the cap thicker toward the center and merging into the stem, which is the widest at the top. The gills run down the stem. This is the only common mushroom which grows on wood, that should be avoided.

The reason for its name may be shown by the following anecdote: Mr. Jones gathered a quantity for dinner. He tells Mr. Brown about the fine food he ate. Mr. Brown goes to the same place and collects some for his table. His wife prepares them; he eats them and becomes very sick. When Mr. Brown recovers, he prepares to punish Mr. Jones for deceiving him. Mr. Jones, however, is not at fault; the mushroom is the deceiver, for it makes some ill while others enjoy it with impunity. The name "Jack O'Lantern" is due, not to its pumpkin yellow color, but to the fact that it glows in the darkness of night. Some people call its glow "fox-fire." It occurs from July to November. (fig. 37)

The PURPLE-GILLED MUSHROOM or CLITOCYBE (*Clitocybe ochropurpurea*) has bright violet-purple gills, and a cap and stem of white to ochre. This common and edible mushroom reaches a size of two to three inches and grows in oak woods from September to November.

The COMMON WHITE CLITOCYBE (*Clitocybe candicans*) is a small, very common white plant of the dense woods. The stem is about an eighth of an inch in diameter and one to two inches long, while the cap, which is often depressed in the center, is about an inch across. It is edible, and found from August to October.

The CHANTERELLE (*Cantharellus cibarius*) (fig. 16) is golden yellow throughout, with a cap which is often depressed in the center. The gills are thick, but very shallow and far apart. The chanterelle is a delicious table morsel, but is sometimes wormy. It grows in rich woods during the rainy season in August and September.

The VIOLET HAIR CAP (*Tricholoma personatum*) (fig. 17) is violet in color, but in wet weather fades out and becomes watery-white. The hair caps have the gills narrower near the stem than elsewhere; sometimes a hair-like line shows where the gill joins the stem. A line from the edge of the cap across the top to the other edge is bow-shaped. This edible mushroom is found in the woods during September and October.

The EMETIC RED RUSSULA (*Russula emetica*) has a very sharp taste when raw. This mushroom, common in the woods, has a cap of bright red, and pure white gills. Although once considered poisonous, it, like the other russulas, is edible. The russulas are medium-sized, about one to three inches high and across, and are found from August to October.

The DARK RED RUSSULA (*Russula atropurpurea*) (fig. 15) with pure white gills, is a mild tasting plant when raw, often attaining a size of four inches across.

The YELLOW-GILLED RED RUSSULA (*Russula alutacea*) closely resembles the two preceding species, but has ochre-yellow gills.

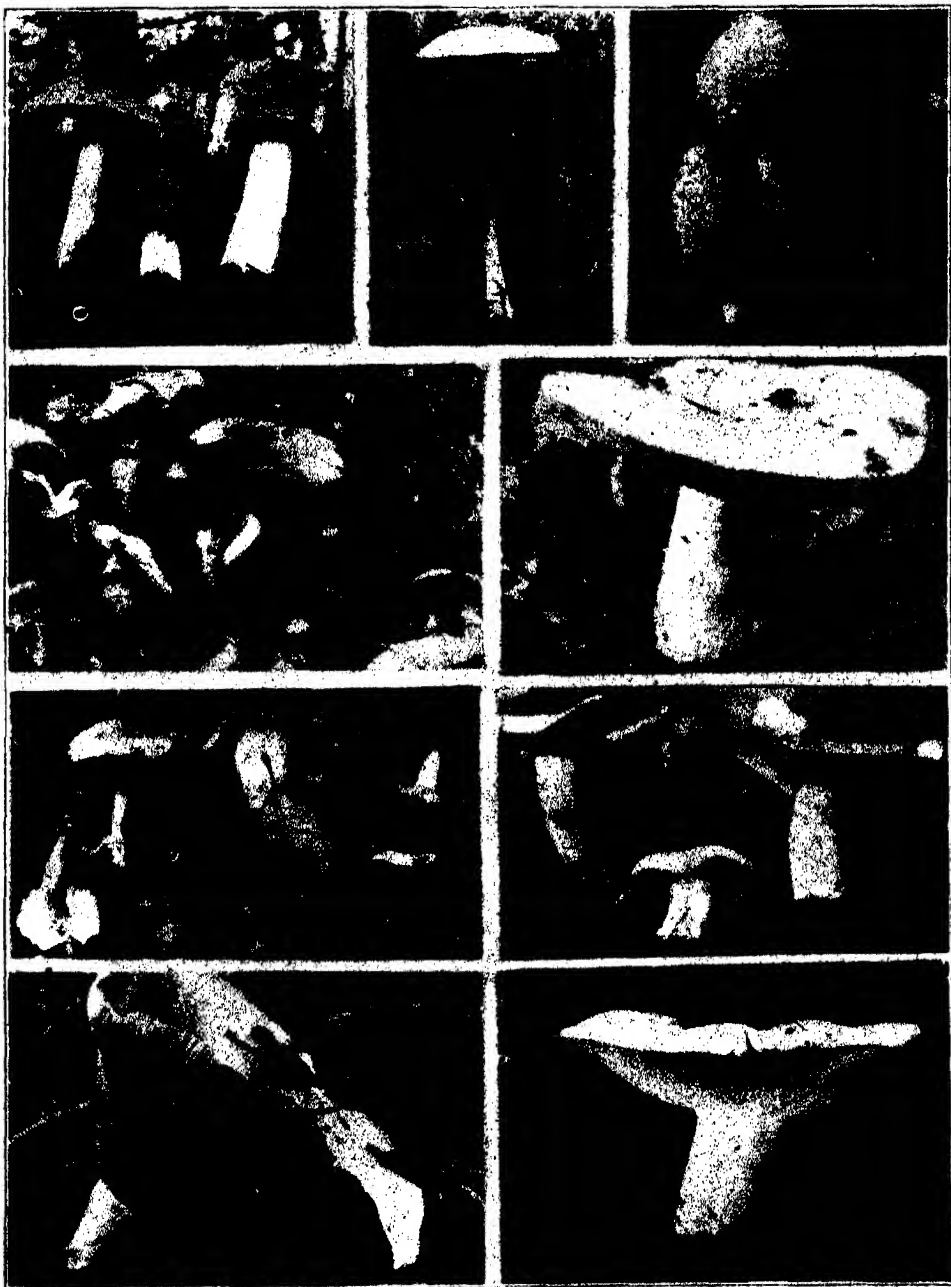


Fig. 11. Fly Amanita

Fig. 14. Honey-colored Mushroom

Fig. 16. Chanterelle

Fig. 18. Gripping Mushroom

Fig. 12. Tall Lepiota

Fig. 13. Shaggy Mane

Fig. 15. Dark Red Russula

Fig. 17. Violet Hair Cap

Fig. 19. Giant White Wax Cap

The BLUE RUSSULA (*Russula cyanozantha*) is another common russula with blue and yellow on the thick cap.

The GREEN RUSSULA (*Russula crustosa*) has an ochre crust on a dull green background. (fig. 39)

The INDIGO-COLORED MILK CAP (*Lactarius indigo*) has indigo colored milk. The most striking feature of the milk cap (genus *Lactarius*) is the flowing of a milk-like sap from broken gills, cap, or stem. In more than half the species the milk is white. All milk caps are quite similar in shape—from a funnel-like to a slightly depressed cap; they have an average to short stem and present a short, heavy-set appearance. The gills are broadest where they join the stem. Milk caps are common during the wet season from August to October.

The PURPLISH MILK CAP (*Lactarius subpurpureus*) has purple milk.

The DELICIOUS MILK CAP (*Lactarius deliciosus*) contains orange-colored milk.

The TAWNY MILK CAP (*Lactarius volemus*) has cream-colored milk.

The PEPPERY MILK CAP (*Lactarius piperatus*) flows white milk copiously where broken; should you taste it, you will never forget why it is called peppery. This plant is shaped like an inverted funnel, with a stem commonly about one and one-half inches long and a deeply depressed cap from two to twelve inches in diameter. It is a remarkable but not unusual sight to see thirty or forty of these white plants on a moist hillside in woods of hard maple or red oak. Some authors say that it is a fine table mushroom; my experiences do not verify their statement, but, tastes differ. It is edible, but of bad flavor.

The GRIPING MUSHROOM (*Lactarius tormenosus*) (fig. 18) can be told by the hairy, incurving margin of the pale ochraceous cap. It has been known to cause severe intestinal pain. Its milk is white, and is acrid to the taste.

The VERMILLION WAX CAP (*Hygrophorus miniatus*) is about an inch across, with a shiny red cap. It is found on wet, open ground from July to September. All the species of this genus have gills which shine like wax; in some, the entire plant has a shining, half-transparent, watery appearance. The gills are rather thick and far apart, as compared with those of other mushrooms. All species are edible.

The YELLOW WAX CAP (*Hygrophorus ceraceus*) is shiny, watery, light yellow, and is found in rich woods from July through September.

The CONICAL WAX CUP (*Hygrophorus conicus*) has an attractive conical bright red or orange-red cap of a watery, shiny texture. It is small, like the two preceding ones, and is found in woods or on moist sand flats from August until October. It becomes black when bruised or dried.

The VIRGINIA WAX CAP (*Hygrophorus virgineus*) is pure white with a cap quite thick in the center, but becoming suddenly thin toward the edge. It is about one to one and a half inches across and two to three inches high. Common at the margins of woods during August and September. (fig. 38)



Fig. 20. Butterfly *Panaeolus*

Fig. 21. Elm Tree Mushroom

Fig. 22. Rooting *Collybia*

Fig. 25. Golden Trumpet

Fig. 23. Lame Foot

Fig. 24. Fairy Ring

The GIANT WHITE WAX CAP (*Hygrophorus sordidus*) (fig. 19) is a beautiful white plant, three to six inches across and two to four inches high, with a sticky white cap. It is of fine flavor, and is found in rich woods during moist autumns.

The RED-STAINED WAX CAP (*Hygrophorus russula*) is a large plant, often six inches across, with a sticky cap. The mushrooms stain red in patches. It is delicious and is found in oak woods during late autumn. (fig. 40)

The ELM TREE MUSHROOM (*Pleurotus ulmarius*) (fig. 21) is a large white species with a cap from two to five inches in diameter. The stem is heavy and tough, and should be removed, using only the cap for eating. This is the only large mushroom with a stem, which is found high up in a tree.

The OYSTER MUSHROOM (*Pleurotus ostreatus*) is a pure white, shelf-like species with gills radiating from near the point of attachment on a log or stump. This tender and delicious plant is two to six inches wide and two to four long, sometimes attaining a thickness of an inch or more. It is found from August to November, in dense clusters.

The SPLIT-LEAF BRACKET (*Schizophyllum commune*) is a dry, shelf-like plant easily distinguished by the peculiar gills which are split down the edge. The gills are white, pink, gray, or dull lavender; the cap is white and densely covered with a woolly coat. It occurs in dense clusters on logs and stumps throughout the year. It is a tough, leathery plant, therefore, not edible. (fig. 41)

The LAME FOOT (*Claudopus nidulans*) (fig. 23) with its white, even D-shaped cap having an inrolled margin, and bright orange-yellow gills, is easily told from other mushrooms. Twenty or more plants, about two inches across, may occur on a single log. It is edible, and found from June to November.

The FAT CAP (*Pholiota adiposa*) is a bright yellow, somewhat scaly mushroom, covered with a very sticky and slippery substance. The stem is not always centered under the cap, but may be on the edge. The stem ring usually disappears early; the gills are yellow, turning rusty. This edible mushroom is common from September to November, on stumps or logs.

The HALF-GLOBE MUSHROOM (*Stropharia semiglobata*) is distinguished by its even, hemispheric, dull yellow cap, with the dark purple-brown gill edges in a plane surface. The stem is straight and slender, and from three to four inches long; the ring falls easily, so is frequently missing. Common in grassy places from May to June and is edible.

The BRICK TOP (*Hypholoma sublateritium*) is known by the tawny, brick-red cap, which is usually about an inch and a half across, and the yellow gills, tinted greenish and rusty, with purplish-brown spores. During September and October it frequently occurs in dense groups around stumps in the woods.

The BUTTERFLY PANAEOLUS (*Panaeolus papilionaceus*) (fig. 20) like the half-globe mushroom, has a cap which is remarkably even shaped and hemispherical. The gills are dark gray, mottled and variegated with a lighter shade of the same color. The intoxicating effects of this plant are variable; small amounts have no effect, while larger quantities produce hilarity. It is very common on manure from May until October. The edible *Panaeolus solidipes* with the stem twice as thick (one-fourth inch) is also very common. It is similar in shape and habitat.

The ROOTING COLLYBIA (*Collybia radicata*) (fig. 22) has a sticky cap, varying from white, through brown and gray, to almost black; the gills are pure white and remarkably even. The most distinctive feature is in the long, slender, very tough, dark stem, which tapers gradually like a root, at its lower end. It is a delicious table mushroom, growing from two to eight inches in diameter, and from five to twelve high. It is common in woods from July to October.

The VELVET FOOT MUSHROOM (*Collybia velutipes*) (fig. 2) gets its name from the dense covering of short, dark hair on the lower end of the stem. It has a sticky, bright tawny-yellow cap with a nut-like taste. It is delicious, and may be collected throughout the year, a few warm days even in winter being enough to bring it forth. It is about an inch across, and is fairly common. More than one hundred plants may be found clustered on a single stump.

The FAIRY RING (*Marasmius oreades*) (fig. 24) is known by its habit of forming rings, partial or complete, a few feet in diameter, consisting of twenty or more plants. It grows in tall grass, and has a tawny-yellow or tan cap one to two inches across, with wide, white gills and a very tough stem which is from three to six inches long. A deliciously flavored plant found from June to September.



Fig. 27. Central-stemmed Polypore

Fig. 26. Hen and Chicken

Fig. 28. Artist's Bracket

Fig. 29. Labyrinth Bracket

The WHITE PIN WHEEL (*Marasmius rotula*) has a white, thin, umbrella-shaped cap, about a fourth of an inch in diameter with a tiny black depression in the center. The straight stem, two to four inches long, about as thick as a straight pin, makes this plant unmistakable. This pretty species is found on logs and sticks in the woods throughout the year.

The ORANGE PIN WHEEL (*Marasmius siccus*) is similar to the preceding, but has a deep orange cap from one half to one inch in diameter. It grows among dead leaves in the forest from July to November.

The BROWN MYCENA (*Mycena galericulata*) grows in dense clusters about decaying stumps or wood, from April to November. This species is brown or reddish brown with a slender stem and is edible. All species of this genus have umbrella-shaped caps.

The GOLDEN MYCENA (*Mycena leajana*) is shaped like the preceding species, but is a beautiful golden yellow throughout. The plant, about an inch across and two inches high, clusters on decaying logs and stumps during summer and early autumn. It is edible.

The GOLDEN TRUMPETS (*Omphalia campanella*) (fig. 25) are small plants a half inch or less across, which decorate decayed logs or stumps with golden yellow clusters from April to November. They are edible, although small.

The GALERA (*Galera tenera*) is a dull yellow plant, with yellow spores, which grows in lawns, or other grassy places, during the summer. The cap is umbrella-shaped, like a mycena. The stem is very slender and three to four inches high; the cap is about one half inch across.

PORE MUSHROOMS

Boletaceae

The COMMERCIAL BOLETUS (*Boletus edulis*) has yellow pores which become green when bruised. This plant is from two to four inches high, with the cap from two to five inches across and one half to two inches thick; it has a delicious flavor and is often sold in dried form and is common in moist woods from August to October.

The BITTER BOLETUS (*Boletus felleus*) has white pores which soon turn pink. It is quite large, from three to ten inches across, two to six inches high, and the cap is from one-half to one and one-half inches thick. The taste is very bitter. Found commonly in woods from July to November. (fig. 42)

The VERMILLION BOLETUS (*Boletus miniato-olivaceus*) has a cap of bright red which fades to olive; the stem and under side of cap are yellow, the latter turning bright blue where bruised. A pretty, edible plant, found during August and September.

The PINE CONE BOLETUS (*Strobilomyces strobilaceus*) gets its name from the thick, wool-like, black or dark scales which cover the cap. The colors of this plant are black and light gray; the pores at first are white, but turn gray. The stem, three to four inches long, is covered with a dark soft woolly substance. The cap is about two inches across and one inch in thickness. This edible mushroom is frequent from July to October in oak and pine woods.

The GOLDEN BOLETINUS (*Boletinus porosus*) has soft, short stems attached to the edge of the sticky, red-brown or tawny caps, about two to four inches across. The pores are bright yellow and are arranged in radiating lines, giving a gill-like appearance. This edible plant is found during the summer and autumn on the ground in rich woods. (fig. 43)

Polyporaceae

The SULPHUR BRACKET (*Polyporus sulphureus*) is a bright sulphur-yellow shelf mushroom, growing in clusters frequently weighing ten to twenty pounds. The plant prefers oaks—dead stumps or living trees. It becomes a bad plant disease when growing on a wound of a living oak. It may be cut into small cubes or grated, and stewed; with the addition of milk and butter it is delicious, tasting very much like chicken. On a large specimen you may break off some each day, and it will continue to live and grow.

HEN AND CHICKENS (*Polyporus frondosus*) (fig. 26) consists of a pure white central core, covered by a thin, dark brown skin from which grow many brownish black shelves. The pore surface is pure white. Clusters have been known to be twelve inches across and twenty-five pounds in weight. This mushroom is edible when young, but becomes tough with age.

The MANY COLORED POLYPORE (*Polyporus versicolor*) is seen everywhere in the woods, on dead stumps and logs and trees. The shelves are thin, about a sixteenth of an inch, with a white under surface and zoned concentrically with brown and various other shades on top. It is tough and leathery. (Fig. 44)

The HAIRY POLYPORE (*Polyporus hirsutus*) has semi-circular or D-shaped shelves about a fourth of an inch in thickness. The upper surface is densely covered with short hairs of grayish white. It is zoned concentrically with alternate grooves and ridges. A tough and leathery species, from one to two inches wide. (Fig. 45)

The ELM POLYPORE (*Polyporus conchifer*) has thin, tough shelves which grow out in encircling zones from a cup-shaped center. A common plant almost always found on dead branches of the elm.

The CINNABAR POLYPORE (*Polyporus cinnabarinus*) has a D-shaped shelf one-eighth to one-fourth inch thick, quite tough and leathery. It is from one to two inches broad, and easily distinguished by the bright red, or cinnabar colored pore surface. Very common on oak logs.

The RUSTY-YELLOW POLYPORE (*Polyporus gilvus*) is about one to two inches broad, D-shaped, and usually about a fourth of an inch thick. The flesh and pores are rusty-yellow, the upper surface somewhat darker.

The CENTRAL-STEMMED POLYPORE (*Polyporus arcularis*) (fig. 27) has a dark, circular cap, one to one and one-half inches in diameter. The stem is black and about two inches long. It is common from April to July. Its autumn counterpart of the same common name is similar in appearance except for smaller pores, and is scientifically known as *Polyporus brumalis*.

The ARTIST'S BRACKET (*Fomes applanatus*) (fig. 28) adds a new layer of pure white pores each year; scratching on this pore surface will produce brown lines. The plant, of woody texture, is from three inches to two feet across.

The LABYRINTH BRACKET (*Daedalea*) (fig. 29) is shelf-like and is easily known by the curving, sinuous pores which twist around each other and appear like a labyrinth. The shelf is from one to five inches across and is D-shaped. One species (*Daedalea unicolor*) is thin and leathery in texture; the other two are thick and of woody texture. *Daedalea confragosa* is from one-fourth to one-half inch thick. *Daedalea quercina*, of oak woods, is commonly one to two inches thick, and is much the largest of the three species; all grow on stumps or logs during late summer and autumn.

CORAL MUSHROOMS

Clavariaceae

CRESTED CLAVARIA (*Clavaria cristata*) is common in rich woods during August and September. It is a white plant, the tips of whose branches are divided into two points, or, less commonly, several points.

In the CUPPED CLAVARIA (*Clavaria pyxidata*) (fig. 30) the tips of the branches end in tiny cups. The plant is white and is common in the woods during the summer and autumn.

The GOLDEN CLAVARIA (*Clavaria flava*) is most common in pine woods during summer and autumn. The plant is from two to four inches high, and its golden yellow color makes it very attractive.

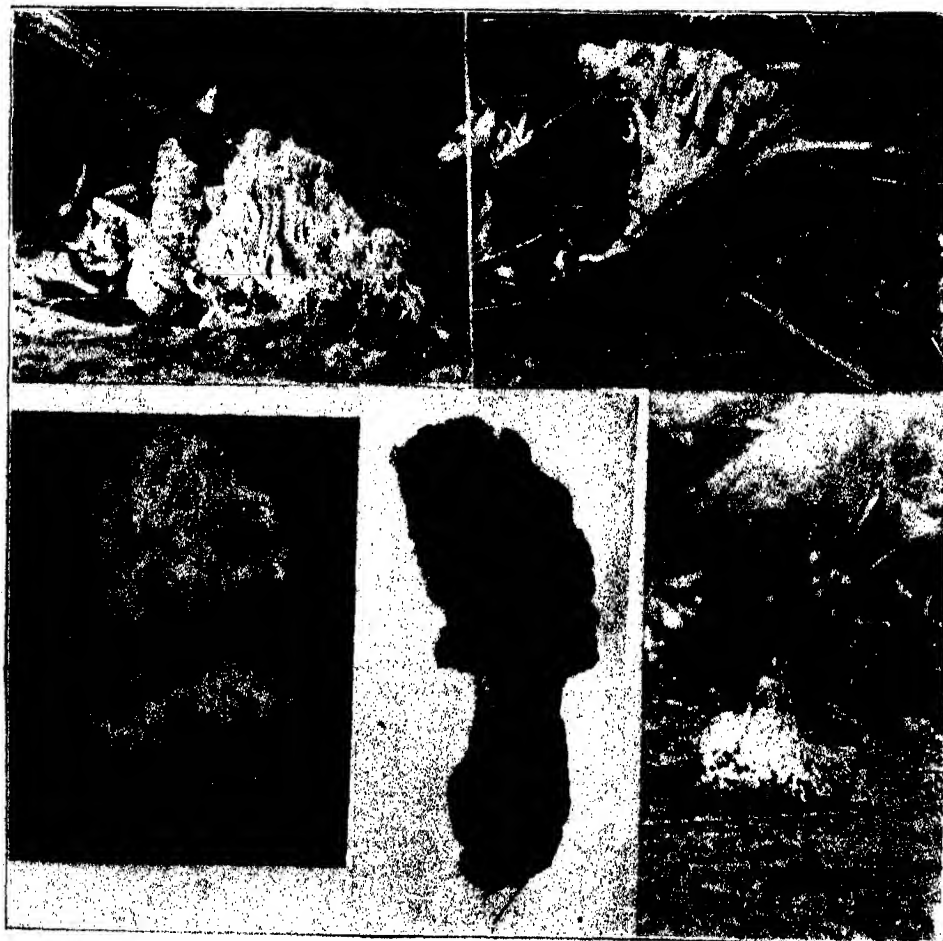


Fig. 30. Cupped Clavaria
Fig. 32. Bear's Head Mushroom

Fig. 33. Edible Morel

Fig. 31. White Thelephora
Fig. 34. Brown Gyromitra

Telephoraceae

The WHITE THELEPHORA (*Thelephora schweinitzia*) (figs. 6 and 31) differs from the other corals in having flat branches. It grows about two inches high in grass and open woods during the summer and autumn months. It is common and edible, but rather tough. This member of the Telephoraceae looks like *Clavaria*. Another, *Stereum rameale*, looks almost exactly like many-colored polypore, but has no pores. It is very smooth and even on the under side.

TEETH MUSHROOMS

Hydnaceae

The mushrooms of the *Hydnum* family have numerous, tiny, teeth-like projections on the under side of the cap, or else they grow into a huge mass with hair-like projections covering a large central core. Several kinds are found occasionally near Chicago, but they are comparatively rare. Some are central-stemmed, others form a large solid mass. The commonest of the central-stemmed species is the spreading hydnum (*Hydnum repandum* fig. 7). The hedgehog mushroom (*Hydnum erinaceum*) is our commonest species of the non-stemmed type. Another common species of the latter type is the bear's-head mushroom (*Hydnum caput-ursi*) (fig. 32). All are edible unless too tough.

PUFF BALL MUSHROOMS

Gasteromycetes

Peculiar Puff Balls

The STINK HORNS are enclosed within puff ball-like structures, one to one and a half inches in diameter, until the spores are mature; then, in an hour or two, the white stem shoots up, from four to six inches in height and one-half to one inch in diameter. Near the top of this stem is the ill smelling spore mass. These mushrooms occur from July to October.

Phallus impudicus (fig. 35) has a reticulated olive-green spore mass, while *Phallus ravenelli* has a smooth olive-green spore mass. Both are known as green stinkhorns. *Mutinus caninus* (fig. 35) has a red spore mass smeared over the upper one-third of the stalk; it is known as the red stinkhorn.

The BIRDS' NESTS (genera *Cyathus* and *Crucibulum*) (fig. 35) are small, nest-shaped plants only one-fourth to one-half inch across, with tiny egg-shaped puff balls inside the "nest." They grow on twigs, on manure, or on bare ground during the summer and autumn.

In the EARTH STARS (genus *Geaster*) (fig. 35) the outer layer of the puff ball splits radially from the top, and the segments spread out like star points. The inner layer, in the center of the star, remains puff ball-like. Earth stars are very common on sand during the summer and autumn; the thicker varieties are also found in rich woods. One peculiar species, *Geaster triplex*, has three layers, the outer forms the star, the middle a cup, and the inner a puff ball.

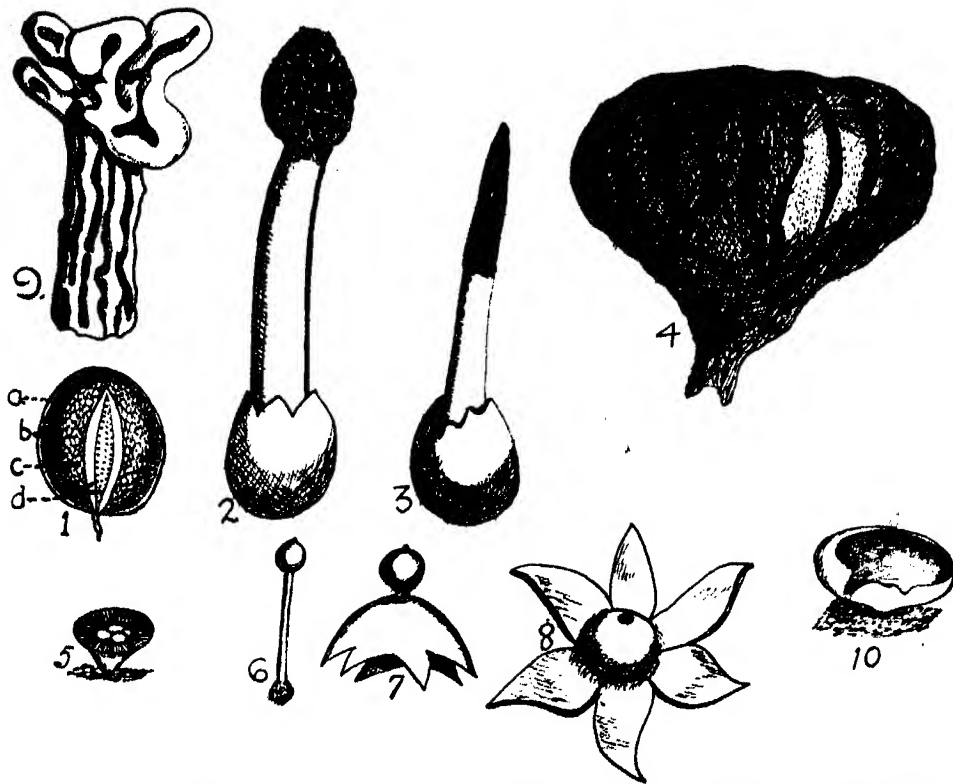


Fig. 35 1. Lengthwise section of the young stage of stinkhorn mushroom. a. Covering; b. jelly-like food-layer; c. spore-mass; d. stem. 2. green stinkhorn; 3. red stinkhorn; 4. brain puff-ball; 5. bird's nest; 6. stalked puff-ball; 7 & 8. Earth stars; 9. side-saddle mushroom. 10. golden fairy cup.

The **STALKED PUFF BALL** (genus *Tylostoma*) are small puff balls on top of stalks, one to two inches high. They are found in the Dunes during summer and autumn. (fig. 35)

Large Puff Balls

The **GIANT PUFF BALL** (*Calvatia gigantea*) is one of our finest table mushrooms. It attains full size, from four to twenty inches in diameter, while still white inside. In this condition it may be sliced and fried. Later the flesh becomes a dusty, olivaceous-brown mass. Found from August to October.

The **BRAIN PUFF BALL** (*Calvatia crantiformis*) (fig. 35) grows in rich woods among fallen leaves, attaining a diameter of three to six inches. The spore mass is ochre-brown. It gets its name from the grooved surface which resembles the surface of a brain.

Small Puff Balls

The **PEAR PUFF BALL** (*Lycoperdon pyriforme*) often grows in dense clusters on logs and stumps. Each puff ball may be as much as one inch high. As the name suggests, it is shaped like a pear. The spore mass is greenish olive. It grows on logs and stumps, and is our only wood-inhabiting species. The flavor is poor.

The WOODLAND PUFF BALL (*Lycoperdon gemmatum*) grows on the ground in the forest. It may be as much as one and one-half inches in diameter. A white, mealy, sometimes spiny covering is present on them while young. It is edible until the center begins to change to a greenish olive shade.

The PASTURE PUFF BALL (*Lycoperdon cruciatum*) is similar to the preceding form, but grows in grassy places, such as pastures and golf courses. It is edible while white within.

Hard Skinned Puff Balls

The BLACK CENTERED PUFF BALL (*Scleroderma vulgare*) is from one to two inches in diameter, and is covered with regularly arranged warts. The entire center is a firm blue-black mass. Found commonly, in paths or on gravelly soil near the margin of woods from July to October. Edible when young.

The SAND PUFF BALL (*Scleroderma flavidum*) (fig. 8) is from one to two inches across, and usually grows in groups of five or six, with the upper part opening star-like, and the tobacco-colored spore mass exposed. The root-like attachment forms a mass under the ground about the same size as the exposed puff ball. Found commonly in sand from July to October.

SUB-CLASS OF SAC-FUNGI — ASCOMYCETES

CUP MUSHROOMS

Pezizaceae

The SCARLET FAIRY CUP (*Peziza coccinea*) is easily recognized by the cup-shaped plant. The inner layer of the cup is composed of minute sacks, corded side by side, each sack containing eight spores. The scarlet fairy cup is from one to two inches across, and is a brilliant scarlet within the cup and white on the outside. The cup is sometimes, but not always, on a stem up to one inch in length. It is edible and may be found in early spring or late autumn on fallen branches in the woods.

The FRINGED SCARLET FAIRY CUP (*Peziza floccosa*) is sometimes one-half inch in diameter. The margin is fringed with long hairs; the color inside the cup is scarlet. It is common on wet logs and fallen branches in moist woods, during June and July.

The VEINED FAIRY CUP (*Peziza venosa*) is known by the branching ridges on the surface of the inside of the cup. The color is light brown to gray. Plants are common during April, in rich woods on the ground near the base of trees. It is edible and is commonly from one to two inches across.

The GOLDEN FAIRY CUP (*Peziza aurantia*) is about one inch across and often of a somewhat twisted shape. The outside of the cup is gray or almost white; the inside is bright golden. It is edible, and may be found during April and May on the ground in rich woods. (fig. 35)

SPONGE MUSHROOMS

Morchellaceae

The EDIBLE MOREL, or COMMON SPONGE MUSHROOM, (*Morchella esculenta*) (fig. 33) grows from one to five inches high. The cap is pitted and ridged, presenting the appearance of a sponge. This plant has been a favorite with the American people for many years, because due to its distinctive appearance, it can not be mistaken for any of the dangerous mushrooms. It is found on the grassy hillsides of open woods and in orchards, during April and May. Properly prepared, the morel is delicious.

The NARROW CAP MOREL (*Morchella angusticeps*) is found in pine woods, especially those in the Indiana Dunes State Park. This plant is from two to four inches high and is common during late April. The cap is dark brown, and but very little wider than the stem. It is edible.

SIDE SADDLE MUSHROOMS

Helvellaceae

The WHITE SIDE SADDLE (*Helvella crispa*) (fig. 35) looks very much like a white saddle, one to two inches across, resting on top of a much grooved stem two to three inches high. It is edible, and may be found from August to October in pine, or mixed pine and hardwood forests.

The BAY GYROMITRA (*Gyromitra esculenta*) is found in pine or mixed woods during April and May. The European form of this species is considered poisonous, but the American plant is edible. The caps are bay-red and from two to five inches high.

THE BROWN GYROMITRA (*Gyromitra brunnea*) (fig. 34) is found on flood plains and in low rich woods during April and May. It is edible, has a brown cap, and is of about the same size as the bay gyromitra.

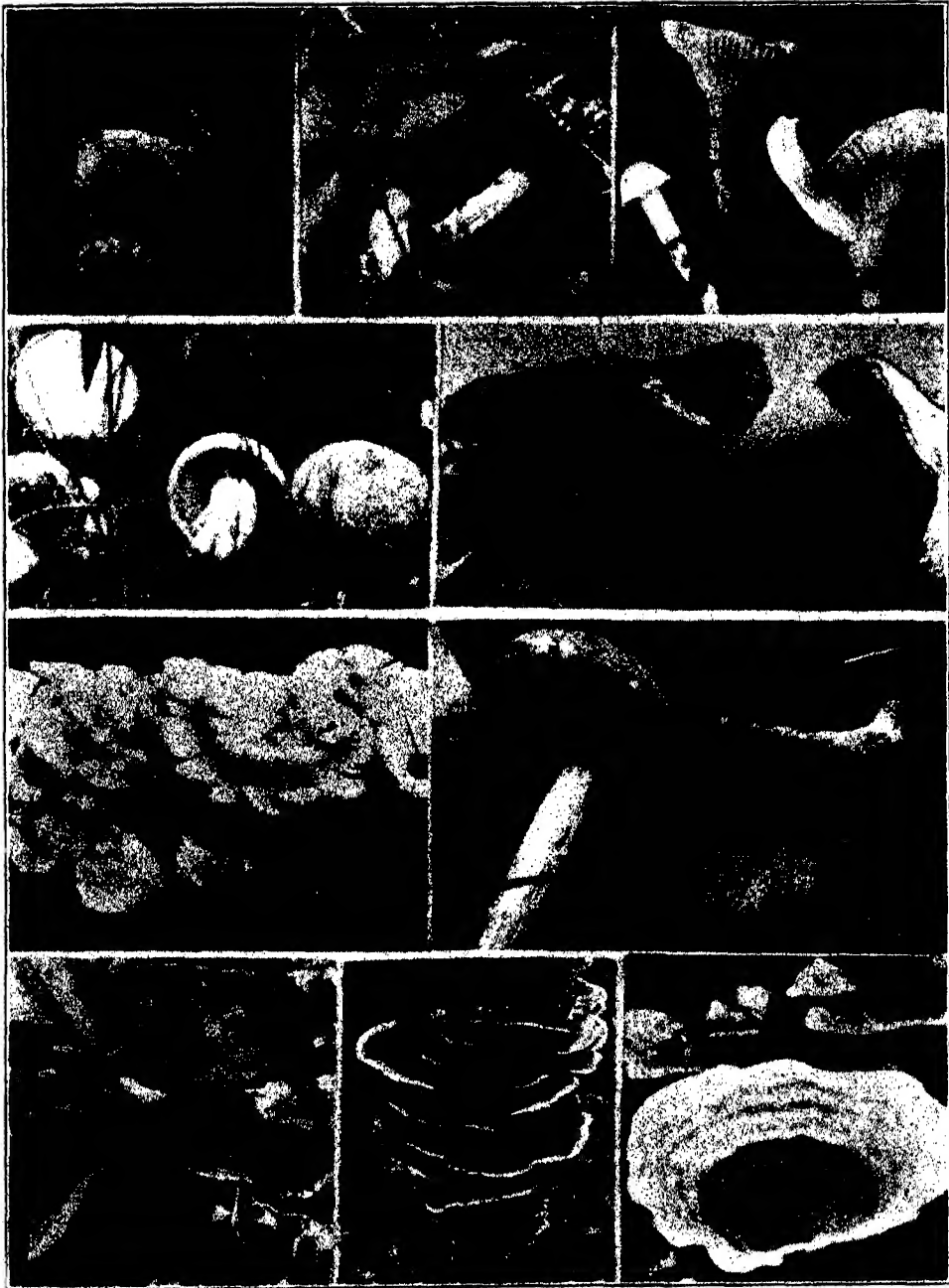


Fig. 36. Commercial Mushroom

Fig. 37. Deceiving Mushroom

Fig. 38. Virginia Wax Cap

Fig. 39. Green Russula

Fig. 40. Red-stained Wax Cap

Fig. 41. Split-leaf Bracket

Fig. 42. Bitter Boletus

Fig. 43. Golden Boletinus

Fig. 44. Many-colored Polypore

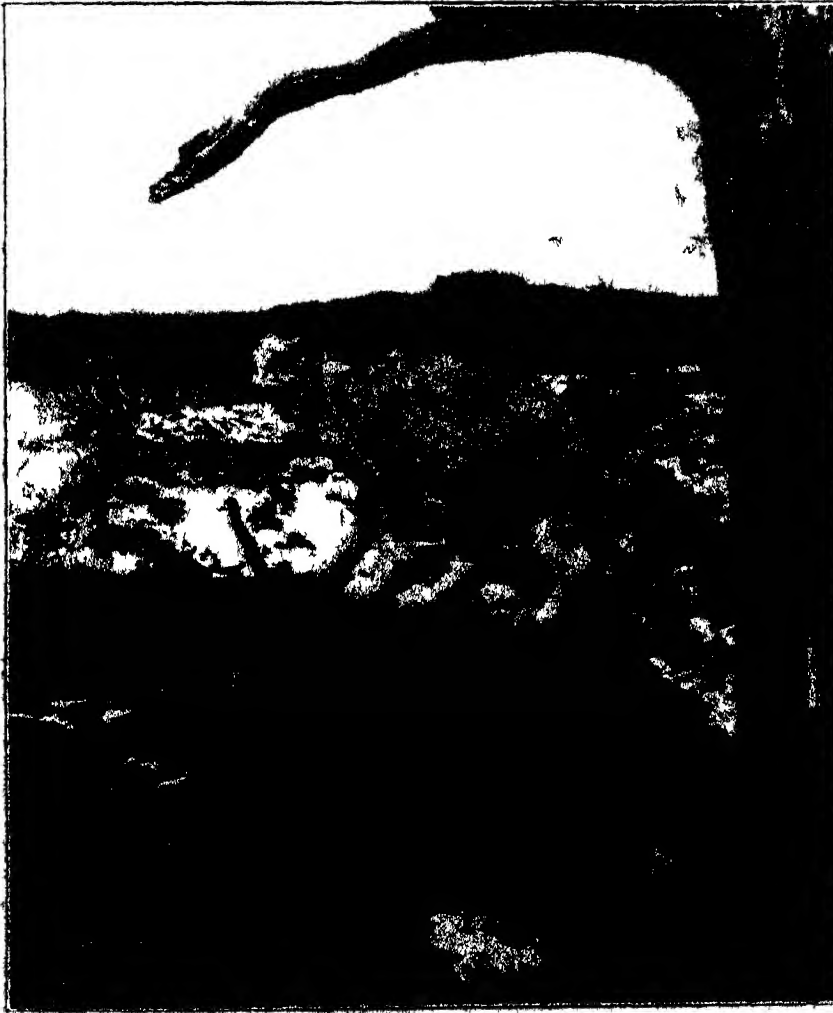
Fig. 45. Hairy Polypore

Program of Activities of The Chicago Academy of Sciences

Vol. 4

October 1933

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THE CANADA LYNX (*Lynx canadensis*)
Detail from the Chicago Environments Group.

AUTUMN MEETING

A joint meeting of the Academy and the Illinois Audubon Society will be held on Thursday, October 26, at 8:00 P.M., to review the motion films made along the Labrador coast on the Academy's field trip of last year. Mr. Bailey will show several reels under the title,

"ALONG AUDUBON'S LABRADOR TRAIL"

One hundred years ago, John James Audubon worked the rugged shores of southern Labrador to gather material for his book on North American birds. He collected many specimens and made many paintings of the interesting species which he found in that remote region.

Mr. Bailey, in company with Dr. Harrison Lewis of the Canadian Department of the Interior, visited the same location and recorded with motion film the habits of the strange sea fowl which dwell among the rocks and offshore islands. Members are invited to bring their friends.

MUSEUM ACTIVITIES

The final group of the Environs series was opened to the public on May 25, the day of the opening of A Century of Progress. Many years have passed since the first section was completed, showing the dunes region of Illinois and Indiana. The series as a whole portrays the country adjacent to Chicago, with animals and plants which once occurred in the region. The one just completed is of the rolling wooded area adjacent to Lake Michigan, north of the city, with the photographic background revealing a panorama of wooded and brush covered hills. One portion shows three timber wolves on the trail as they have emerged from a hazel thicket, while the other part contains the Canada lynx, another of the large carnivores which ranged widely in search of food. The background is an enlarged photograph which was made in the Academy dark room. It was colored by Mr. Earl G. Wright and Mr. William Walthal, while the remainder of the exhibit was prepared by Mr. Wright.

Many requests have been made by visitors for exhibits of reptiles and amphibians of the region, but adequate specimens for display were not available. Now, however, due to Mr. Necker's field work and the cooperation of members and friends who have sent in specimens from all parts of the state, a fine start has been made. Mr. Wright is preparing casts made in celluloid, as time permits, and has made molds of one half of the fifty species which we know from the Chicago area. More specimens, from all parts of our region are desired, and the Academy will be grateful for any gifts.

The extensive geological collection is being reclassified and arranged for the convenience of students. For the past year, Mr. Walter Y. Cox, a graduate of Northwestern University, has been placing the rocks and minerals in Dana order, and has made an excellent start in recataloging the five to six thousand specimens. This has been a difficult task, requiring many hours of effort in checking data. The exhibition series has been completely reorganized to conform with a more modern arrangement on the third floor, which is now under consideration of a committee recently appointed by the scientific governors.

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1933



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The Chicago Academy of Sciences

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CHICAGO, ILLINOIS

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AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during this season in the Assembly Hall, Sundays, at 3:00 P.M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

October 29—Birds of the Labrador Coast

Mr. A. M. Bailey

Motion films of the wonderful bird colonies found along the Canadian Labrador, made last year for the Academy's film library, will be shown to the public for the first time.

Illustrated with Slides and Motion Pictures

November 5—Western Wonderland

Dr. Louis J. Tint

Our members will recall the beautiful photographs with which Dr. Tint illustrated his lecture last season. He has just returned from the west with additional records of the beauty of our country.

Illustrated with Natural-color slides

November 12—Birds and Trees of the Smokies

Mr. O. M. Schantz

Few of us realize the wonders of this rugged country which has just been set aside as a national park. Mr. Schantz, a scientific governor of the Academy, is an authority on the region, and will illustrate his talk with photographs which he has made during his many years of field work.

Illustrated with Slides

November 19—What Mushroom is that?

Dr. V. O. Graham

The fields and wooded areas of our own region afford many opportunities for study. Dr. Graham is a scientific governor of the Academy and is president of the Conservation Council.

Illustrated with Slides

November 26—Tahiti

Dr. Edmund Andrews

The delights of travel in the South Seas will be told by another scientific governor of the Academy. Dr. Andrews has just returned from the coral isles of the southern Pacific.

Illustrated with Slides

December 3—Geological Snapshots of the West

Dr. John R. Ball

The story of the west, as told by the rocks and imbedded fossils, will be revealed by Dr. Ball, Honorary Curator of Paleontology.

Illustrated with Slides

FIELD WORK

Field activities were carried on this past year in various localities. Mr. E. V. Komarek and his brother, Mr. R. V. Komarek have returned from a year's work in the Smokies and have secured a fine series of the animals of that region for the Academy's collections. They obtained forty-eight of the fifty-four species of mammals which are thought to occur in that area, and collected one form which was new to science. Twenty-five species of reptiles and amphibians and a small series of birds were also taken.

Late in the spring, Mr. Francis R. Dickinson, Vice-President of the Academy, and his son, Mr. Stirling Dickinson, joined the party for the purpose of taking motion pictures of the animal life of the Smokies. Many species of birds were photographed by Mr. Dickinson, including the humming bird, blue-gray gnat-catcher, yellow-breasted chat, white-eyed vireo, Acadian flycatcher, and others which were not represented in the Academy's film library.

The Academy party's headquarters are at Greenbrier Cove, formerly a mountain community isolated from the "outside" country by poor roads and mountains. Just above the Cove stretch miles of virgin wilderness, possibly one of the wildest parts in eastern United States. There are growths of rhododendron and laurel, and forests of magnificent trees, many of which are more than six feet in diameter. In such forests many mammals such as bear and deer are still abundant. It is indeed gratifying to note that the National Park Service has set this area, the Greenbrier section, aside as the wilderness area of the Smoky Mountains National Park.

The work of the Academy's party was greatly facilitated by the splendid cooperation of the National Park Service, particularly by Mr. C. Ross Eakin, Superintendent of the Park, and Mr. Charles Dunn, Chief Ranger, as well as by the mountain people.

Mr. Tappan Gregory, Honorary Curator of Mammals, Mr. Robert Sturgis, Dr. W. H. Hazlett, and Mr. Bailey returned to the Huron Mountain Club, on the south shore of Lake Superior, to continue photographic work which Mr. Gregory has carried on in that vicinity for many seasons. It is through repeated effort only, that flashlight photographs of animals are secured, and Mr. Gregory and his associates have now assembled remarkable studies of deer, bear, and smaller forms of the area. Motion films were made of the great northern diver, nesting on an island in one of the beautiful lakes.

Mr. Walter L. Necker, in company with Mr. D. Dwight Davis of Field Museum, collected reptiles and amphibians in the southern counties of Illinois during the early spring, and added many species to the study collection. Material was also secured for the new series of exhibits now being prepared. The Academy is greatly indebted to Mr. Karreker and Mr. Raymond Akin for the courtesies extended on this trip.

Through the courtesy of Mr. Samuel C. Hunter, Secretary of Dune Acres Corporation and a member of the Academy, two members of the staff were enabled to work on the property of the Corporation, which is probably the only large tract in the Indiana Dunes remaining virtually unchanged by civilization. Many dune plants, which will be reproduced in celluloid and installed in the environs groups were collected.

SPRINGTIME IN THE SMOKIES

For those who like nature unadorned, who have eyes for indescribable sunsets, who can understand and enjoy humanity in the rough (when it is honest as well as rough), in short, for those who can "find tongues in trees, books in the living brooks, sermons in stones, and good in everything," a great new playground lies in the making, down where eastern Tennessee and western North Carolina meet. In that back-water between the currents of pioneer migration, an area of nearly half a million acres, containing the highest mountain ranges east of the Rockies, forests of astonishing variety and beauty, streams that invite and reward the angler, and a people unspoiled by modernity, is being gradually converted into a national park, distant not more than two days' drive from most of our eastern and midwestern cities. Fine roads will soon make the heights accessible to all; overnight cabins and camps will add the comforts which some require; and a large section of the park will be kept unimproved, except for a few trails, for such as want to push on foot or horseback into really wild country. At present there is a pleasant hotel at Gatlinburg, and a converted school house, serving as a hotel, at Greenbrier. In the latter, arriving on May 17, I was the fourth guest to register in 1933, and during my two weeks' stay only one more turned up. The food was good, but it was no place to go if you like crowds.

For a year or so the Chicago Academy of Sciences has maintained a field representative at Greenbrier, to collect specimens for its study collections and to make a survey of the fauna of the Smokies, on which relatively little work has heretofore been done. As an excuse for visiting him at his headquarters, the mere enjoyment of idling for a fortnight did not seem adequate; but his reports of interesting species of birds nesting in the locality suggested motion picture photography. By the simple means of a camera and a bird blind, the qualms of conscience were allayed and the trip became an expedition.

An atmosphere of friendliness seems to pervade these mountains. They are not rugged, save for a few of the higher peaks; their grandeur is inviting rather than forbidding. The charm of the scenery is not in its magnificence, but lies rather in change and color. The day opens under a sky of serene purity. By noon masses of cloud, gray and white, have materialized from nowhere and are deliberately wheeling and twisting through distant gaps. Whether in full sun or beneath the cloud shadows, even the nearer mountain ranges have turned blue—not a hazy tint, but clear, deep, and translucent. By early afternoon it is raining, and raining hard, either in the next cove or, more likely, in the one you are in. Half an hour later the sun is out and every stone, every leaf, every wet spray of laurel or flaming azalea reflects its light. As the day wears on the colors of the earth change and shift to the sky, and if the clouds are not all gone the brilliance in the west is startling.

Hidden away in unexpected coves are small clearings where mountaineer families in one or two room cabins are living as their forebears have lived since the opening of the west lured the first settlers into this remote corner. They still grind their corn by the overshot wheel, still have pioneer hospitality for strangers, still sing mountain songs to the strumming of banjo or guitar. One of these ditties announces the keynote of their independent spirit in its concluding words:

*He drives a super-six,
I ride a mule that kicks;
Nobody's business if I do!*

These people have little book learning, but ask them about anything in the range of their experience and whether the subject be human nature, religion, politics, or natural history, you will find that they observe and think to better purpose than many a college graduate!

Though the Smokies yield but a meagre living to their human inhabitants, they must be kinder to bird life, for the variety and abundance of resident and migratory species is striking. Thanks to able assistance, the motion picture work went well and, as is usual on such trips, one day stands out above the rest. To find any nest of the ruby-throated hummingbird is lucky; to find one only ten feet from the ground is luckier; but to find one in the heart of the mountains, yet within a few yards of a deserted cabin from which boards for our elevated platform could be obtained, is miraculous. And I have used my superlatives too soon, for to crown it all, this particular hummingbird not only sat placidly while we hammered together our staging, but fed the young at less than three feet from the whirring camera and the flapping bird blind—and seemed to like it. The metallic glint of its plumage, the jewel-like nest of gray lichen, no bigger than a half dollar, and the grace of the bird's deliberate motions, made one of those pictures, mental as well as photographic, which provide ample reward for occasional disappointments.

F. R. Dickinson.

VOLUNTEER WORKERS

There are many people in Chicago and the vicinity, with time (and some with money, we hope) who have a desire to do natural history work. The Academy's financial condition is sound and it can carry on, as in the past, with a slight curtailment of activities, but there are many worth while projects which can be accomplished by individuals giving time or money. Various collections are needed; field expeditions to interesting places need sponsors; the film library has become increasingly valuable and the films should be made available to the schools of the United States—and could be for a small amount annually. The shell and insect collections should be systematized and re-catalogued—a life-time position—without pay—for some one! Members are urged to visit the Academy and to take part in the activities.

ANNUAL MEETING OF THE INLAND BIRD BANDING ASSOCIATION

W. I. Lyon, president of the Inland association, announces that the annual meeting will be held at the Academy on Thursday, October 26, with papers and informal discussions beginning at 1:00 P.M.. In the evening, the group will join with members of the Academy and Illinois Audubon Society to view films made along the Labrador coast. The Academy has served as headquarters for the Inland association for the past few years. Mr. E. R. Ford, Honorary Curator of Birds, is secretary of the banders. All who are interested in birds, and the problems to be solved by banding, are invited to attend and to join the various groups which will have dinner in nearby restaurants. Those having papers to read are requested to send notices immediately to Mr. Ford.

AT TRAILSIDE MUSEUM

During the year and a half of its existence, the Academy's Trailside Museum at Chicago Avenue and Thatcher Road, has steadily increased in its collections, its exhibition space, and interest manifested by the public.

It is not the aim of the museum to obtain great collections, but rather to so exhibit the wild life of the Forest Preserve that it may be accessible and understandable and of interest to all. Yet this means a many sided exhibit and an increasing number of specimens. The new specimens have been mostly contributed by an ever growing army of interested boys and girls. The youngsters have brought in material varying from dead crayfish and a drowned-out pheasant's nest to a handsome, full-grown, and very much alive woodchuck and a perky, lively, brilliant-colored sparrow hawk.

As has been indicated, the increase in public interest has been most gratifying, but perhaps the most important aspect of the situation is the interest of the boys and girls. A number of them are steady, regular, and enthusiastic visitors. The most wide-awake and intelligent of these have been organized into a Junior Staff, whose donated services have been of quite unforeseen value to the museum. At the same time the museum is offering to the Junior Staff an unusual opportunity for study and training along natural history lines. For instance, Bert Wright interested himself in snakes. He studied, dissected, and made drawings of the poison apparatus of a rattlesnake, working up his results into an exhibit which has attracted much attention. In his study of the tumor-like growth which caused the death of our indigo snake, he enlisted the cooperation of the West Suburban Hospital.

In similar fashion Don Hirsch and Jim von der Heydt have interested themselves in birds, Bob Allen in mammals, Ted Groenke in fungi, Al Batty in grasses, Harold Roundy in insects, Elmer Howard in taxidermy, and Jean Corbett in descriptive writing and publicity for the museum. We are glad to have these young people who are so interested in nature work, for we believe the Trailside Museum will prove to be, through its Junior Staff, a real training ground for naturalists.

Only one community has been served as yet, but we hope that with the continued cooperation of the Commissioners of Cook County Forest Preserves, additional museums will be established in the near future.

FALL AND WINTER LECTURE SERIES

Members and friends of the Academy have generously responded to our request for their services for the coming lecture season. Due to conditions, the officers were confronted with the necessity of shortening the series, but our friends have responded nobly and the full number of lectures will be given, as in years past. It is gratifying to the lecture committee to have this evidence of interest and cooperation.

MUSEUM MEETING

The American Association of Museums held its annual meeting in Chicago during the early part of June, with headquarters in the Chicago Historical Society's new building. Museum directors and their associates from all parts of the country were present. The program was arranged so that half-day sessions were also held in Field Museum, Art Institute, and in the Academy.



NOTES FROM

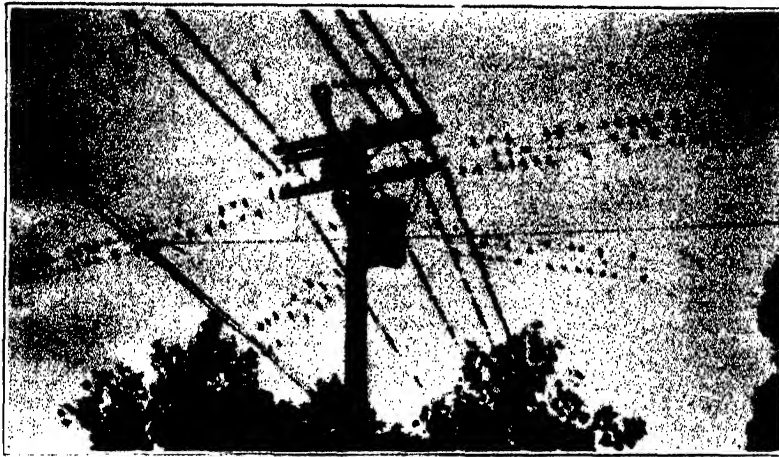
The Illinois Audubon Society

(Section of Popular Ornithology of the Chicago Academy of Sciences)

MIGRATING MARTINS

On the evening of August 11, I had the pleasure of witnessing a most spectacular flocking and roosting of the purple martin. Shortly before sunset I was driving north along the lake shore through Evanston when I noticed several martins flying in a straight course instead of their usual feeding flight. The birds became more numerous as we moved farther north; on reaching the intersection of Clinton Place and Sheridan Road I was astounded at the number of these birds circling around overhead. On the northwest corner of these streets there is a vacant lot of about a half acre, having a dense growth of trees approximately fifty feet high. It was into these trees that they were gradually alighting, but there was no reduction of the number of those in the air, as others were streaming from all directions, particularly from the northwest, to join the whirling mass overhead. On close investigation, I found the above mentioned trees so loaded with birds that I thought surely the smaller branches would break. A surprising thing to me was the quietness of the flock; only scattered whistles and notes were heard.

I then moved northwest about five blocks and found, in spots, the power lines along the Drainage Canal solidly lined with birds which were leaving, gradually, to join the air procession to the roost. At the time, I estimated that



Gathering for the Flight

I had seen approximately ten thousand birds, but there must have been more, as I had not witnessed the start of the roosting. Males, females, and immatures were present in the ratio expected at this time of year.

The next evening, I again visited this locality in order to witness the congregation from the start. Shortly after 7:00 P.M. the martins started congregating on the telephone and electric wires along the Drainage Canal and adjacent alleys to the east and west, and from Maple Street north to Wilmette Harbor. Within about fifteen minutes the wires, in places, were strung solid with birds. In addition, there were still several thousand in the air. They were not alarmed by my presence directly under them, as they sat on the wires, so I was able to make some fairly accurate spot counts, as well as secure a few pictures. By counting blocks of one hundred birds on the wires, and estimating those in the air, I judged that there were approximately fifteen thousand birds in the one-fourth square mile north of the intersection of Maple Avenue and the Drainage Canal.

About an hour later I moved over to the intersection of Clinton Place and Sheridan Road, and a few minutes after my arrival the birds came into that locality and alighted in the same trees mentioned under August 11. They came in swarms—the air above was simply full of birds. After several thousand had perched in the trees I stationed myself directly under them. There was a decided din caused by the wings of the birds beating on the leaves of the trees, the sound somewhat resembling that of a very heavy rain falling on the leaves. By 8:30 P.M. they had all settled in the trees and no martins were to be seen elsewhere.

When congregating at this roost, several thousand birds came in from directions other than from Maple Avenue and the Drainage Canal, so in all, I estimated that there must have been close to twenty thousand birds. While watching them, I met Mr. Bartlett, who had come from Winnetka to watch them, and was informed by him that this is an annual congregation, and he had witnessed it for the past ten years. An article on this congregation and roosting appeared on Page 4 of the Chicago Tribune on August 12, 1933.

James S. White.

NOTES

Young saw-whet owls have been found again this year, fairly close to the city, and young great horned owls were taken in Cook County well within the metropolitan district. No record of the latter breeding in Cook County has heretofore been made; the species has been rare in our area for the past sixty years.

There are few resting and feeding places for beach birds between the Waukegan flats and the Indiana Dunes. Shores protected by breakwater structures, whether of piling, loose rock, or cement, afford no advantage to migrating shore birds. Something might be done upon the long stretch of new-made lakeside land at Montrose Avenue in Lincoln Park, to provide a large, shallow lagoon with a sand beach for birds of this type. It would become a location of much interest to bird students. If properly railed off so that the lagoon and its beach would be strictly protected, there is no doubt that in time, it would become a concentration area, especially in late summer, for sandpipers and plovers. Gulls, terns, and ducks, also would be visitors.

Reports from various sections of the county indicate an increase of herons. The small colony of great blue herons of the Desplaines River, found last year, contained fully as many birds this year. This is true also of the colony of black-crowned night herons west of McHenry. We are advised of a colony of great blue herons established on a gun club preserve on the Illinois River, above Peoria.

Water birds of many species are becoming abundant in southern states, because of protection given them, so, as certain areas become crowded, they are extending their range in search of food and breeding places. American egrets and little blue herons are becoming regular late summer visitants in our region, and, if protected, we hope that some may breed in years to come.

According to an investigation by the National Audubon Societies, the effect of cat license ordinances, where they have been adopted, is negligible. Payment of the fee meets objection, and enforcement is difficult. A better plan now proposed, is the identification of cats by means of tags, which may be had at so low a cost as five cents. Untagged felines could be taken to the pound where owners might identify and redeem them on payment of a small fee. Cats not so redeemed should be destroyed.

Members will be interested in the notes which are to be published during the coming year. The Society plans to issue Gault's new list of the Birds of Illinois, for many requests are at hand for the one which is now out of print. Mr. Gault has been spending the last year in bringing his work to date. In addition, Mr. E. R. Ford is compiling his list of the Birds of the Chicago Area, which, it is planned, will be published in two parts, one on the "Game and Water Birds" and one on "Land Birds."

Mr. Ford, Honorary Curator of Birds at the Academy, has spent many years in this vicinity as an active field man; he has compiled all notes which he has found pertaining to the birds of our area,—a list approximately three hundred and seventy-five species and subspecies.

The Academy's systematic collection of local birds is a reference exhibit for all students who wish to identify specimens, and these forthcoming notes will be welcomed by those who desire to know the species recorded from this vicinity. Only a few copies of Woodruff's "Birds of the Chicago Area" remain available at the Academy.

FEEDING HABITS OF A CAPTIVE WILSON'S SNIPE

That little can be learned about the more intimate habits of our secretive birds by mere field study was forcefully brought to my attention by a Wilson's or Jack snipe under observation in my aviary. During many years in the field, I have never been able to watch the feeding of this species in very great detail, nor, have any of my colleagues; therefore, I may be justified in recounting my experiences with this bird.

In the autumn of 1932, Mr. Walter A. Weber brought me a Wilson's snipe (*Capella delicata*) with a broken wing tip, to add to my collection of live birds; the bird was not badly injured, and was a beautiful specimen in the rich glossy plumage so characteristic of this marsh-dwelling form. As he was remarkably tame, I anticipated no difficulty in keeping him, but when I placed him in a small cage and sprinkled a few meal worms on the floor, he paid not the slightest attention to them, even though they were crawling in plain sight. The bird was active, and not shy, but he appeared not to recognize the worms as food. As an experiment, I decided to make conditions as nearly natural as possible for my captive, so I put the worms in a pan and covered them with soft mud. The snipe ran back and forth in the little enclosure, thrusting his long beak through the small wire mesh, as though looking for an avenue of escape, until, in course of his exploration, he crossed the pan and felt the mud under his feet, whereupon he immediately began to probe and soon found the worms, both varieties, which he ate greedily. He took, however, only a few and then stopped eating for about fifteen minutes; then he took a few more and stopped for another interval. Although some of the worms were crawling about on the surface of the mud, the bird did not notice them and took food only by probing, except when the sensitive beak accidentally came in contact with the worms. In other words, he seemed to sense food through touch, and not through sight.

In a few days I placed the bird in my large aviary with many passerine species. He had become quite tame by this time, so I experimented further. I took a few earthworms in my hand and held them toward him; he came running to me and paused about six inches from my hand, with the long beak outstretched, and then came forward slowly, much as a blind man would feel with a cane, until the beak touched my hand. Then with rapid motion, the snipe felt about the palm and between my fingers until the beak touched one of the worms, which he immediately took.

He was fed in this manner several times a day, but I also kept worms in the pan of soft mud. Although the snipe rested upon the moist ground, and probed whenever he desired food, he would leave the pan and come to my hand at any time.

Earl G. Wright.

Program of Activities of The Chicago Academy of Sciences

Vol. 5.

January, 1934

No. 1.



THE GRAY WOLF (*Canis nubilus*)

These wide ranging carnivores were found commonly upon the western plains, but they have become rare in recent years. Individuals vary widely in color, ranging from gray to black, and specimens shown in the Academy exhibit illustrate these pelage variations. The above photograph shows a portion of the fourth group of the Chicago Environs series; the photographic background is from a typical stretch of rolling, bush covered country adjacent to Lake Michigan, just north of Chicago.

WINTER PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during this season in the Assembly Hall, Sundays, at 3:00 P.M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

January 28—Adventures with Birds

Mr. William I. Lyon

Bird banding has already contributed considerably to the knowledge of birds and the extent of their travels. Mr. Lyon has banded some 58,000 in little more than a dozen years, and will tell something of the purpose of this work and some of the results.

Illustrated with Slides

February 4—Wild Flowers as Medicine

Mr. Wallace F. Worthley

An account of the use of our wild flowers in medicinal compounds by the early Americans, by the Indians, and in our present day curatives.

Illustrated with Slides

February 11—Changes in Medical Science

Dr. Morris Fishbein

Dr. Fishbein will give a review on the advances in medical science and their effect upon medical practice.

February 18—Liquid Gold—The Story of Oil

Dr. Charles H. Behre

Academy audiences have on other occasions enjoyed Dr. Behre's talks on economic geology, and will be sure to find this story of oil an interesting one.

Illustrated with Slides

February 25—Rifle Men and Rifle Making in the Great Smokies

Dr. Arthur I. Kendall

Dr. Kendall, of the Northwestern University Medical School, has found a pleasing hobby in the study of the making of rifles by the mountaineers, and the machinery used in the manufacture of these fire arms, as prevailed in earlier times.

Illustrated with Slides

March 4—Sumatra

Mrs. Fay-Cooper Cole

Mrs. Cole, well known as lecturer, traveler, and author, has made several visits to the island of Sumatra, studying the sociology and the customs of its people, as well as the anthropology of the island. Her late book entitled "Savage Gentlemen" is a fascinating account of the life of Sumatra.

Illustrated with Slides

Reserved seats will be available to members until 3 o'clock.

THE FOSSILS OF THE CHICAGO REGION

JOHN R. BALL

Honorary Curator of Invertebrate Paleontology

Figures drawn by Mary Cooper

Chicago is underlain by strata of a sedimentary rock called dolomite. Originally this rock was a thick limy sediment that settled on the sea floor when an arm of the ocean covered the site of the city. The lime and magnesian carbonates which make up the most of the rock were derived from the land masses bordering the inland sea, and from the shell life of that sea. Limy sediments are known to accumulate at a slow rate. It has been estimated that one foot of this particular sediment might be deposited in 2,250 years. The dolomite is from 300 to 400 feet thick at places in and near the city. Its slow accumulation represents, then, the passage of many years. Moreover, this period of deposition is removed from our present age by an inconceivable lapse of time. According to some estimates the date of this ancient sea may be placed back, possibly, to more than 300,000,000 years ago.

Geology has long employed a simple time scale to designate in a relative way the age of the various layers of rock making up the earth's crust. It sometimes is called the "Geologic Time Clock." These ages are not given in terms of years. Instead, the individual rock units, similar to the dolomite mentioned above, are arranged in appropriate groups known as "systems." The time involved in laying down the rocks of any system is known as a "period." A proper name is selected that will designate, according to its usage, the period and the system. Thus the Chicago bedrock, the dolomite, belongs in the Silurian system, and its age, correspondingly, is that of the Silurian period. In general usage the Time Clock at present employs at least sixteen names, many of them a definite reference to some locality where the rocks of that age are characteristically developed. In reading down through the list of names appearing in the time scale one is passing from the more recent (and therefore nearer) to the more distant ages of the earth's history. The Silurian period has so many names placed above it, and but relatively few below it, that it is thus clearly shown to be a very early episode in the entire history of the earth.

The Chicago dolomite with its definite color, thickness, and other characteristics, may be traced for many miles in every direction leading away from Chicago. It is not exposed at the surface in every nearby locality but often is recognized by records obtained from deep wells. Traced in this way, it is found to be practically the same rock which forms the brink of Niagara Falls. For this reason it long has been known as the "Niagara" dolomite.

The Niagara dolomite contains abundant evidence that life was amply represented on the sea floor, and probably also floating in the waters of the Niagaran sea. That evidence is the presence in the rock of many remains or traces of shells known as fossils. A fossil is defined as "the remains of an organism, or some record of its presence, preserved in the rocks of the earth's crust." The fossils found in the dolomite really are but the few remnants of life that have escaped nature's ruthless destruction. For in the time taken to make a fossil, the ceaseless grinding of storm waves and currents and the ravages of chemical attack had time, likewise, to destroy. The fossils found are the souvenirs, one might say, of that greater life assemblage that has been erased entirely before any fragments of it could be preserved.

**TABLE OF GEOLOGIC SYSTEMS AND PERIODS, WITH LIFE
CHARACTERISTICS OF EACH PERIOD**

		System and Period	Life
Cenozoic 60,000,000 years	{	QUATERNARY	The beginning of man and his rise to dominance; extinction of some of the large mammals.
		TERTIARY	Rise of more modern mammals, with extinction of archaic forms; rise of modern flora.
Mesozoic 200,000,000 years	{	CRETACEOUS	Extinction of giant reptiles; extinction of the ammonites, a beautiful form of the chambered molluscs, or cephalopods, like the chambered nautilus.
		COMANCHEAN	Spread of flowering plants and modern insects.
		JURASSIC	Rise of toothed birds; spread of primitive mammals; extensive marine faunas in Europe.
		TRIASSIC	Rise of giant reptiles; rise of cycad-like plants; rise of modern corals.
Paleozoic 500,000,000 years	{	PERMIAN	Extinction of trilobites and primitive corals; spread of primitive amphibians and insects; rise of primitive reptiles.
		PENNSYLVANIAN	Trilobites almost extinct; spread of swamp forests, tree ferns, leading ultimately to the formation of coal.
		MISSISSIPPIAN	Spread of ancient sharks; dominance of sea lilies or crinoids.
		DEVONIAN	Spread of fishes; trace of first amphibian; spread of land plants and development of im- pressive forests.
		SILURIAN	Rise of air-breathing invertebrates, scorpions; early expansion of crinoids; spread of reef- building corals; trilobites decline; first land plants.
		ORDOVICIAN	Many bivalves known as lamp-shells, brachio- pods; many mosses, or bryozoans; spread of corals and molluscs; rise of vertebrates, fresh- water fishes.
Pre-cambrian over 2,000,000,000 years	{	CAMBRIAN	First abundant record of marine life; trilo- bites, primitive, and possibly ancestral crus- taceans, fully developed and dominant; rise of molluscs and a few other primitive forms.
		KEWEENAWAN	Meager record of invertebrate marine life.
		HURONIAN	Simple forms of plant life, algae.
		KEEWATIN	Only indirect evidences of life.

References in the preceeding table to the age of the earth at any stage in its history, as stated in years, must not be taken too literally, but may be regarded as fairly trustworthy approximations. Laboratory study of the rate of disintegration in radioactive minerals is proving to be the basis of a new and apparently precise mode of determining geologic time. The figures quoted in the table are in harmony with the findings of this method of study. The geologist gladly utilizes the findings of other scientists in such studies and makes full acknowledgment of the sources. But at the same time he finds that the practical application of the life record that the rocks contain enables him to locate himself in the time clock as he studies the record.

Each system of rocks, in individual respects and collectively, has enough of the life record in it to make it distinctive when compared with other systems. Each system, practically, has particular fossils restricted to itself. These fossils become the "horizon markers," the key fossils to that particular system. For example, the Silurian system, with its marked increase in coral and crinoid life, with certain peculiar forms of brachiopods, with its first land plants, and with evidences of decline in trilobites, has a marked aspect in these features alone. Then, when further details of beginnings and extinctions of various genera and species are taken into account, the determination of any rock belonging to that system may be made with practical finality.

From the fossil record that is preserved in the Niagara dolomite, a number of conclusions may be drawn, based, however, largely on negative evidence. For example, vertebrates, animals with backbones, although present during the Silurian period in other places, have left no remains, as far as now known, in the Niagara dolomite. Plant life is not clearly represented in the dolomite although marine plants undoubtedly abounded. The Silurian system is distinguished by the first appearance of land plants in England, Scandinavia and Australia. But in the Chicago region, if land plants existed, they obviously had but a remote chance of final preservation. Microscopic, one-celled animal life, the protozoans, are not visible in a casual examination of the rock. The microscope, however, is revealing that protozoans are represented in practically all of the ancient rock systems.

Recognizing, then, the antiquity of Silurian life, it is not surprising to find that in the majority of cases the fossils are the traces of organisms now extinct. While this is true particularly of more or less individual cases, genera and species, it is also true that many of the fossils have some genetic relationships with forms still in the present seas. And a number of hardy genera, especially certain bivalves called brachiopods, have enjoyed a racial history from the Ordovician period, perhaps earlier, to the present time. On the other hand, large groups, families and even sub-classes, that flourished in the Silurian or earlier have passed completely out of existence.

It is a background like this, perchance, that makes fossil hunting a rather fascinating pastime. One is in sympathy with the reaction of a Freshman student who wrote a sentence like the following at the beginning of his report. "A rock is a rock and has never been anything else, but a fossil once was a living thing." While fossils are easily found, they are not so easily named. As representatives of extinct life they do not acquire the common names that may be applied to our birds and flowers of the open fields. Practically every fossil species from the time of its first discovery has been labeled with a formidable scientific name. Perhaps this is unfortunate. But, since some fossils are clearly different from living forms, there has not been much choice in the matter — no common name is available to apply to them. It is true that quarrymen, familiar with certain fossils, refer to them as petrified "butterflies," or petrified "frogs." But with every quarry-

man having the freedom of his own choice, his usage is as difficult to acquire as the scientific usage. A striking illustration of this is afforded by a common Silurian fossil of wide distribution in America and Europe. It is a brachiopod, known among scientists the world over as *Pentamerus oblongus*. In one locality, however, where specimens of this fossil are numerous, they are known as "petrified pigs' feet." In a case like this, probably more people would be found who are familiar with the implication of *Pentamerus oblongus*, than those familiar with this application of "petrified pigs' feet."

It may be interesting to scan the fossil assemblage from the Niagaran of the Chicago area in respect to the larger groups of organisms rather than to burden the page with the names of many genera and species. The following table presents, then, the names of the sub-kingdoms, or largest classification groups among the animals. In these groups are included the names of subdivisions, or classes, which, in most cases are classes of existing organisms. The list is not as complete as the classification tables appearing in zoological textbooks. It is not even an all-inclusive table of the fossils found in the Chicago area. But the classes mentioned include the fossils most commonly found.

SUB-KINGDOMS (PHYLA) AND CLASSES OF THE INVERTEBRATES

- I. One-celled animals of microscopic size, FORAMINIFERA and RADIOLARIA — PROTOZOA.
- II. Sponges. PORIFERA
- III. Corals, Graptolites (extinct) and Hydrozoans—COELENTERATA
- IV. Sea Cysts, Sea Buds, (both extinct), Sea Lilies—CYSTOIDEA and BLASTOIDEA are the first two Classes; the Sea Lilies are called CRINOIDEA or Crinoids—ECHINODERMATA.
- V. Worms. ANNELIDA
- VI. Sea Mosses. BRYOZOA
- VII. Bivalves, but not clams or oysters — BRACHIOPODA
- VIII. Bivalves, clams and related forms, snails, and the chambered Nautilus — MOLLUSCA. PELECYPODA, GASTROPODA and CEPHALOPODA are class names for the three groups.
- IX. Cray fish, Insects, Centipedes, the King Crab — ARTHROPODA. Cray fish, lobsters, etc., fall under the CRUSTACEA; Insects, centipedes, and King crab under INSECTA, MEROSTOMATA, and ARACHNIDA, respectively. The most important Arthropod considered in this paper is an extinct Sub-Class, the TRILOBITA or Trilobites.

The first two groups, the PROTOZOA and the PORIFERA, are not recognized readily in collections of fossils from the Chicago region. The FORAMINIFERA must be sought with a microscope; the Sponges are not common. The very minute forms sometimes are preserved in silica, a hard, flint-like substance. They are found frequently in the clay inclusions, or "pockets" of the dolomite and are washed free from the clay quite easily. Or, if present in the dolomite, they may be set free by the use of acid which will attack the dolomite and dissolve it but will not affect the silica.

Sponges are a very common fossil in some localities where Silurian rocks underlie the surface. About their only resemblance to the modern sponge is a somewhat globose or sub-spherical form, and a porous aspect which is responsible for the phylum name—PORIFERA, "pore-bearing." One fossil, now regarded as a sponge, found in Chicago, is so problematical in its general character and relationships that it has been regarded at times as a plant, a Foraminifera, a

coral, and now a sponge. It is the same genus—*Receptaculites*—as the famous “sunflower coral” of the lead and zinc region of northwestern Illinois. That particular fossil, however, is in an older system of rocks than the Silurian. The Chicago *Receptaculites* bears the full name of *Receptaculites tessellatus* and specimens may be seen in the Museum of the Academy.

The third Phylum, the COELENTERATA, holds a place of interest in the fossils of the Chicago Silurian rocks. The Silurian was a period marked in America and elsewhere by the development of numerous coral reefs. These reefs extend much farther away from the equator than coral reefs are built in the seas of today. They are quite common in Milwaukee and vicinity, in Chicago, particularly in the southwest part of the city, and in northern and northwestern Indiana. The reefs are called “coral reefs,” but it is probable that other organisms, algae, hydrozoans, and bryozoans contributed to the upbuilding of the reefs. One genus of the hydrozoans, called *Stromatopora*, grew to rather immense proportions, itself, forming colonies several feet thick and as much as ten feet across. It is rather easy to picture such organisms adding materially to the growth of a reef.

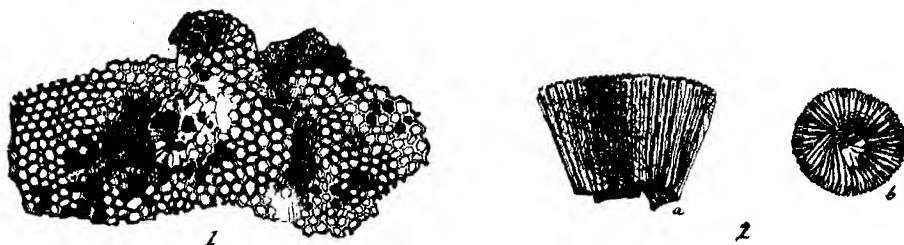


Fig. 1. *Favosites*. One of the reef-building types of fossil corals, each individual occupying one of the openings shown in the illustration. The entire structure is commonly called the “honey-comb coral.”

Fig. 2. *Zaphrentis racinensis*. An individual, or “cup” coral.

(a) Lateral view; the animal rested in a depression in the upper portion of the cup.
(b) Basal view of the cup where broken at “a”. The radial lines indicate “septa” or partitions in the cup.

Coral structure is usually destroyed in the reefs by a recrystallization process of the dolomite. However, specimens of the “honey comb coral,” *Favosites* (fig. 1) are found frequently in the reefs, together with other types of colonial corals. Individual corals of the type shown in Figure 2, are collected from the reefs and elsewhere in the strata of dolomite. A coral of this kind bears the name, *zaphrentis racinensis*. The individual corals also are called, “cup” corals, or “horn” corals.

The remaining class of the *Coelenterata*, the graptolites, became extinct soon after the Silurian period was over. Graptolites are not found commonly in limestones or dolomites. The fossil looks almost like a mark made on the rock by a soft lead pencil. Some of them bear even a more striking resemblance to types of prehistoric writings on stone. It is this trait that has given rise to the name, “writing on stone,” *Graptolites*. The fossils are better preserved in shales than in limestones, but in 1925 the late Dr. Stuart Weller of the University of Chicago, with his associates, found some specimens of graptolites near Blue Island. Along with the graptolites, a Silurian type of worm was found in the dolomite, an instance even more rare than the finding of the graptolites. Dr. Weller and Dr. Croneis of the University of Chicago, and Mr. Sharat K. Roy, of the Field Museum, have studied and described the graptolites and the worm. (See bibliography at the end of this paper).

The next Phylum, the ECHINODERMATA, is represented today by the starfish and sea urchins. Crinoids are living in the present seas, also, but not in the

abundance that characterized the Silurian and later periods. Crinoids, known also as "sea lilies," or "feather stars," are most beautiful organisms having a striking resemblance to plants. The studies of Dr. Weller, in 1900, brought out the fact that of all the Silurian crinoids known at that time, 18% of the total species were found in the Chicago region. New genera and species were so numerous in the collections of Mr. William Egan and others that Dr. Weller gave to one new genus the name of *Chicagocrinus*, while a new species was termed *Periechocrinus chicagoensis*. The latter species, together with one that was named in honor of Mr. Egan, are illustrated in this paper, figures 3 and 4.

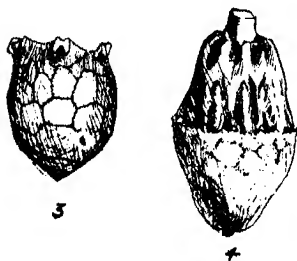


Fig. 3. *Periechocrinus chicagoensis*. A species of crinoid from the Chicago area, first described by Dr. Weller.

Fig. 4. *Periechocrinus egani*. A crinoid named in honor of Mr. W. C. Egan who has collected fossils so extensively for the Academy of Sciences.

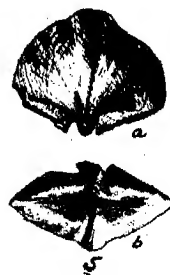
The cystoids and blastoids (see Table on page six) are not as numerous in the collecting grounds near Chicago as the crinoids. However, a quarry west of Lyons on the Joliet Road yields numerous crinoids, while a quarry a few miles farther north near LaGrange possesses numerous cystoids.

The creatures of the next two Phyla, the BRYOZOA and the BRACHIOPODA, have been grouped in one Phylum, the MOLLUSCOIDEA, for many years. The name "MOLLUSCOIDEA" has been applied because of the resemblance that the brachiopods bear to the bivalved mollusc, the clam. However, that resemblance cannot be observed in the bryozoans that secrete a delicate, coral-like skeleton that spreads over the surface of the rock or of another fossil. Their fossils indicate that they lived in colonies, so that in England they are called *Polypzoa*. The bryozoans are seen frequently in the Chicago quarries, and the brachiopods are even more

Fig. 5. *Spirifer radiatus*. A fossil brachiopod where the shell has been dissolved leaving the hardened sediment that filled the valves of the animal after its death.

(a) View of the animal in about the position it had when attached to sea bottom.

(b) Cardinal view where the lower portions of both valves are towards the reader.



numerous. One type of brachiopod, shown in figure 5, is of interest because it is the first appearance of a genus that became very prominent in later periods of geological time. It is a genus that presents in many respects an interesting picture of the extensive evolution that has developed in the brachiopods alone. It is called *Spirifer*, and is such an early appearance of this particular genus that some students use a sub-generic term to designate its somewhat ancestral qualities—*Eospirifer*, meaning "dawn spirifer."

The next Phylum, the MOLLUSCA, is one that includes so many large classes, and so many unique individuals in the fossil world that a choice of appropriate specimens for illustration becomes a difficult matter. *Mytilarca acutirostra*, (6) an ancient type of clam, *Phanerotrema occidens*, (7) an ancient snail, and

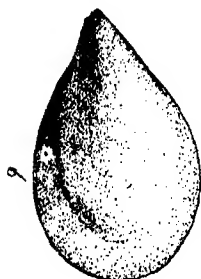
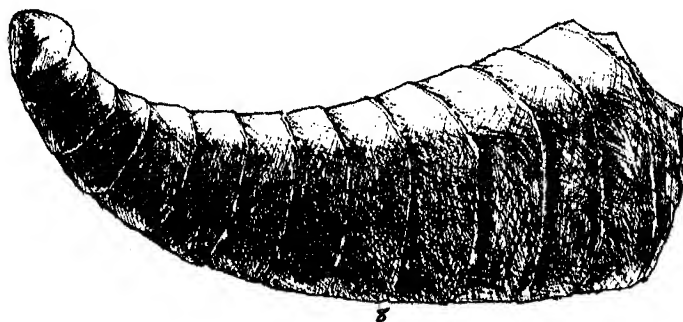


Fig. 6. *Mytilarca acutirostra*. Closely related to the present day clam, the fossil also preserved as the internal filling or "mold" of the valves.

Fig. 7. *Phanerotrema occidens*. The gastropod, or snail shell.

Cyrtoceras (?) (8) and *Dawsonoceras annulatum*, (9) both ancient types of the familiar chambered nautilus of today, are all characteristic molluscs. All of these Silurian molluscs grew to rather large size and in consequence the living chambers of the shells that became empty after the death of the occupant were filled by the sediments of the sea. This sediment packed tightly inside the shells and eventually buried the shells as well. In the packing process the most minute tracery both of the internal and external surfaces of the shells was effected. If the shells themselves subsequently were dissolved, there still would be retained the impressions made in the plastic material of the sediments. These impressions are termed "molds" and "casts" and serve as the "record" of the organism's presence as mentioned in the definition of the fossil on a preceding page. The

Fig. 8. *Cyrtoceras* ?
A type of chambered Nautilus where there was but a slight curvature of the shell, in contrast with the closely coiled chambered Nautilus of today.



two cephalopods illustrated, *Cyrtoceras* (8) and *Dawsonoceras* (9) show interesting steps in the evolution that has culminated in the chambered nautilus of today. The cephalopods in the Silurian and earlier periods were a straight form, collectively called *Orthoceras*, the name *Orthoceras* meaning "straight horn." Then came a slight curvature in some forms, gradually increasing in amount as illustrated by *Cyrtoceras*. And then, even before the end of the Silurian, certain forms became as tightly coiled as the nautilus of today. The generic name of "Nautilus" is even applied to some Silurian forms. Species of these nautiloids, nautilus-like creatures, multiplied until there have been made known at least 2,500 described forms. And yet another large group of coiled cephalopods, the

ammonoids, even more numerous than the nautiloids in their day, has become totally extinct. This large and powerful race, at one time the undoubted competitors of the vertebrates in the ancient seas has had a most spectacular and tragic history.



Fig. 9. *Dawsonoceras annulatum*. A primitive type of Nautiloid, perfectly straight, but instead of being smooth, as was the case in other cephalopods, possessed strong ring-like ridges or annulations.

The remaining group, the trilobites, of the Phylum ARTHROPODA, is another large group that has become extinct. In fact, a rather significant connection may be seen in their story and that of the cephalopods, just preceding. They are a most ancient group, having attained full development by the period which shows for the first time an abundant life record. That period, the Cambrian, began fully 500,000,000 years ago. But in the Silurian the trilobites began to decline. Some have thought that possibly there is some connection between the decline of the trilobites and the rise of the cephalopods. Of course this has to be but a conjecture, but it at least is rather a striking coincidence that the Silurian period should witness the beginning of both tendencies in the two groups involved.

In spite of the fact that the trilobites were beginning their decline, their fossils are among the most abundant in the Niagara dolomite of Chicago. Dr. Weller found that nearly 40% of all American species of trilobites known in 1907 are present in the Chicago area. This is "the largest number of Silurian trilobites recognized from any area of similar size in America." (See the bibliography appended). Three characteristic and striking instances of Silurian genera are illustrated in *Cheirurus Calymene* and *Bumastus*, figs. 10, 11, and 12.

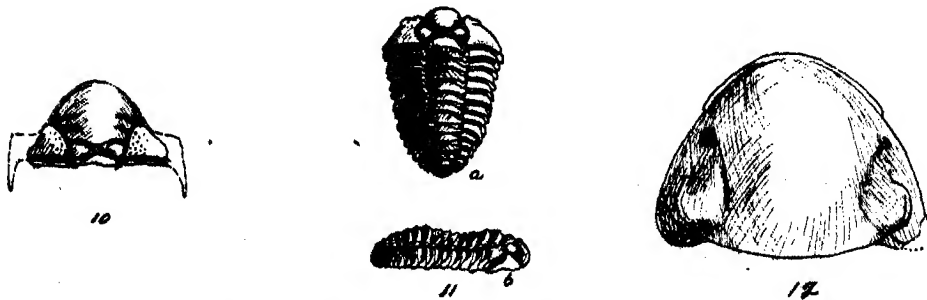


Fig. 10. *Cheirurus niagarensis*. A fragment of the head of a trilobite.

Fig. 11. *Calymene niagarensis*. The specific name, "niagarensis" indicates how characteristic the fossil is of the Niagara formation.

Fig. 12. *Bumastus insignis*. Dorsal view of the head or cephalon of a trilobite.

It is quite safe to say that fossil collecting began in the Chicago region at least 95 years ago. For in 1838, Professor Charles Upham Shepard mentions in an article in the *American Journal of Science* that he had secured fossils in the Chicago region. He cites fossils that today are placed among the corals, brachiopods and molluscs, using names for them that have changed greatly in more recent usage. So the collecting, naming and study of fossils in the Chicago region have had their "Century of Progress."

Through the middle of the 19th Century incidental study of fossils in the general region of the westernmost of the Great Lakes was made in connection with the exploration of the Upper Mississippi Valley and the Lake Superior region. During this period the presence of coral reefs in the dolomite became known, and the relation of the rock to that at Niagara Falls was traced.

In 1865, a significant paper appeared describing the fossils found in a quarry at "Bridgeport," then regarded as a "suburb" of Chicago. The Bridgeport quarry is operated by the Stearns Lime and Stone Company at South Halsted and West 27th streets and has been maintained for 82 years. The paper was written by Professor Alexander Winchell and Professor Oliver Marcy, outstanding geologists of Michigan and Illinois, respectively. Their studies were the first to make known the Bridgeport locality as a unique repository of fossils. In addition to naming and describing several new species, they pointed out how the fossils of the Chicago region are similar to those found in New York, Indiana, Wisconsin, Canada and Europe.

About this time, the Chicago Academy of Sciences began its significant contributions in the field of general science. The beginnings of the Academy date back to 1856. By 1871 the 1st volume of Transactions had been printed. But as early as 1859 an extract of the Transactions by J. H. McChesney contained descriptions of several Niagaran fossils from Bridgeport and Joliet. And then Volume 1 contained a very comprehensive article by the same author describing fossils from many rocks in the western States. About 30 years later, the publications of the Academy again came into prominence when the studies of Dr. Stuart Weller were published in the *Bulletins of the Natural History Survey* of the Academy. The results of his studies have been quoted in the preceding portion of this paper. The publications of the Field Museum of Natural History, and articles appearing in private contributions are listed in the Bibliography that follows this page.

Certain of the best collecting areas near Chicago have been referred to in the earlier parts of this paper. The Bridgeport quarry is still one of the best. The quarry on Joliet road, about one mile east of Mannheim road contains in its northwest corner a coral reef that yields many fossils. One should not contemplate a fossil collecting trip to a stone quarry without securing permission from the management. A stone quarry is not one of the safest places in the world. There are blasts of powder to dislodge the rock; there are tracks with moving trains; there is always the possibility of a painful and even fatal fall. So one should cooperate with the owners of quarries in making arrangements to visit. Small, abandoned quarries on Stony Island, 92nd Street and Stony Island Avenue yield some fossils. But even here, there have been accidents and for a time one quarry was fenced. The "Island," in all probability is one of the coral reefs mentioned in this paper. The development of the canal system south and southwest of Chicago has made possible a great deal of collecting in the "spoil heaps" that border the canals. It was in a pile of rock of this kind, southwest of Blue Island, that the Silurian worm and graptolites were found. Other quarries in the vicinity of Lyons and LaGrange will yield a fair collection.

An amateur collector of fossils should provide himself with a ten-cent cold chisel and a hammer with fairly heavy head. The easiest collecting will be from some pile of rock where the quarrying operations have broken the rocks into small fragments. A khaki collecting bag and some old newspaper to wrap specimens will complete the equipment. The writer would feel honored and gratified if from ten to a dozen persons, willing to engage in a fossil hunt should leave their names and addresses at the Office of the Academy. Details of a trip of this kind could be sent later to interested parties.

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NOTES FROM
The Illinois Audubon Society
Section of Popular Ornithology of the Chicago Academy of Sciences)

AUDUBON SOCIETY WINTER MEETING

Members should reserve Thursday evening, January 18, for the winter get-together meeting at the Academy. Many groups plan to have dinner together in nearby restaurants, as on previous occasions. Make an effort to come early. The hour of the meeting is eight o'clock.

William L. Finley, noted field naturalist and photographer, will be the speaker and an announcement of the title of his lecture will be sent at a later date. Mr. Finley is recognized as one of the foremost nature photographers, and a rare treat is promised to all who enjoy the out-of-doors.

Bring your friends—the Audubon Society needs more members

**N. B.—The title of Mr. Finley's lecture will be
ALASKAN WILD LIFE**

THE GOLDEN EAGLE

The golden eagle is one of our largest birds of prey. Nature has ordained this bird to be a predatory species and mankind has adjudged it an enemy. For this reason alone the eagle can claim no protection on any front and is slowly passing before the advance of modern progress and civilization. Few indeed are those who pass up an occasion to execute the death sentence when opportunity arises. Granting that all possible claims of harmful food habits are true (*which they certainly are not*), and that he does exact a large toll on game birds and other beneficial species, does he not have the same right to do so as thousands of other hunters and sportsmen? I am sure that all true bird lovers would gladly donate their share of game birds to this king of the avian world. All would be more than repaid by the charm and interest which this species adds to any community.

The former range of the golden eagle probably included nearly all of the United States excepting the southern-most portion. The present range may be roughly outlined as from the eastern foothills of the Rocky Mountains, west to the Pacific. In many localities within this territory, however, the birds are wholly lacking. Eagles are by nature unsuited for life in a thickly populated community. Even in the sparsely settled areas of our western states the high powered, long range rifle together with the systematic poisoning campaigns for predatory animals, has hastened their disappearance.

The broken foothills country of northeastern Colorado and southeastern Wyoming now offers one of the last strongholds for this splendid bird. This locality is too arid for agricultural development and the soil too thin to support more than a scattered covering of grass. Ages of erosion have cut trough-like canyons thru the soft sands and left a country which will never be reclaimed by man. This escarpment country, rugged, wild and fascinating, is an ideal home for the golden eagle and in a way typifies its characteristics.

Eyries are not common along the cliffs or on the huge embattlements. Each pair of eagles seems to maintain its domain over a chosen locality. Within this area two or three nesting ledges will be in use by the pair. One eyrie is selected early in the spring, the nest repaired and relined and used as a home for the new family. The other old nests are then used merely as feeding perches or possibly as resting places for the male while the female is incubating her eggs. When the nest or eggs are not disturbed by man and the young are successfully reared in a nest, that nest will normally be used again the following year. If however, the nest is disturbed in any way, even tho the eggs or young are not destroyed, the pair will select another ledge the following year and may not return again to that particular nest for several years, or until something drives them from one of the other nests. The nest is usually placed on a shelf or in a pocket of a cliff, well protected from above by a projecting ledge or overhanging rocks and never accessible from beneath. Nesting ledges are frequently well protected on a cliff two or three hundred feet high but occasionally an eyrie is found just over the top of a small ledge which is not over forty or fifty feet high. When space is available the nest becomes a huge affair after a few generations of use. I have seen several that were six or eight feet in height and ten or more feet in diameter. One nest which I found in Platte County, Wyoming, was situated in a pot hole in the face of a huge cliff on the rim of the Goshen Hole. This nest was absolutely inaccessible to anything without wings. A neighboring rancher told me that to his knowledge, eagles had raised young in that nest every year since 1891.

Regardless of all newspaper stories about the attacks of eagles in the defense of their nest, they always retreat at the approach of man and with the possible exception of the ferruginous rough-leg hawk, I know of no other species of bird that will desert its nest more quickly or show less interest in the defense of its young. At the very first sight of man, the eagle will slip away from her eggs or young and will seldom, if ever, be seen again unless the observer is well concealed. Their keen vision is almost beyond belief. Upon several occasions when nearly a mile from a nest which was only visible to me thru field glasses, I have seen the female slip quietly off the nest and then fly low along the face of the cliff until lost to view down the canyon. During March and April, 1931, I visited at least a dozen occupied nests; of these only two pairs showed the least interest in their home. One eagle with young a few days old, was flushed from her nest, she circled around overhead a few times and immediately went back to the nest when I left the vicinity. The other pair had young about a month old, they both circled around a few times but disappeared as soon as I neared the nest. Neither was seen again at this or subsequent visits. I believe that this attitude is a developed characteristic, due more to self preservation after having been shot at for generations with high powered rifles, than due to the lack of any maternal concern of the parents.

Rabbits, ground squirrels, prairie dogs, and other small mammals constitute the principal items of their menu, which naturally has to vary according to the abundance of the different species common to a particular area. Under present conditions I doubt whether more than ten percent of their food could be considered as injurious. They of course occasionally catch game birds and possibly would carry off a fawn but such items could only constitute a very minor portion of their normal food supply. All of the smaller beneficial birds and songsters are too small to be considered by eagles. Golden eagles feed readily on carrion. This is particularly so during the winter months or other times when their normal game is scarce. The mortality among range cattle and sheep is rather high; one or more carcasses are always to be found along the cliffs or near water holes. The carrion feeding habit is very much to be regretted because nearly every carcass on the range is now thoroughly poisoned in accordance with the present predatory animal control program. A poisoned eagle never lives to be governed by experience. This has resulted in much of the western eagle country being completely cleared of the birds.

Many inquiries among ranchers in Wyoming failed to disclose a single instance where eagles had been known to disturb farmyard poultry or domestic stock excepting that dead or sickly lambs which were deserted by their mother were frequently carried away. One nest with young which I visited in Laramie County, Wyoming, contained a weasel, a rattlesnake and parts of a rabbit. The young of another nest which were kept under observation for several weeks, were fed almost entirely on rabbits, with an occasional prairie dog.

L. R. Wolfe

WATER AS AN ATTRACTION FOR BIRDS

I have had sufficient reason during the past year, to wonder if most bird students realize the importance of water in attracting bird migrants and residents about the home. During the last August a heat wave descended on the Lake County countryside and with it a long dry spell. All the gravel roads were covered with inches of fine dust, and the trees and bushes and fields along them were coated with it as a result of the clouds raised by passing machines. Even the hardy goldenrods and sunflowers bowed beneath the tremendous dry heat. But for an occasional song sparrow's lay, there was not one cheerful bird note to be heard; the molting birds seemed to have disappeared. Summer waned, trees died, and day by day the landscape became more a picture of desolation and neglect. September came, and with it the plants became still more wan, not the healthy color of other years. And still it did not rain!

I have a small cement basin countersunk into my yard at Pistakee Lake, in which the water is kept constantly active by drippings from suspended cans. All through the summer this pool had been the gathering place of all resident birds, and with the coming of September a movement of migrant birds became noticeable. One afternoon we stood on the road outside our cottage and counted approximately four-hundred robins entering our woods in straggling flocks that stretched away to the northeast. At least half of these descended on our grounds. From a window ten feet away we counted ten birds in the pool, while at least twenty-five could be seen in the trees nearby waiting for a chance to come down. As on all other occasions, the robins took complete possession and savagely warned all other birds away. At such times it was not uncommon for a flock of cedar waxwings to drop out of the air and contest possession, nor were they absent this day. These little birds refused to be daunted by the robins' snapping bills, and when one of the defenders ventured a rush, the cherry bird singled out just seemed to disappear from its path. Vireos of every kind darted in and out and hovered over the melee. Rose-breasted grosbeaks and several species of warblers, among them the black-and-white, next monopolized the bath while the robins returned to the lowlands and wooded margins of sloughs until the migrating urge should send them southward. White-throats and thrushes followed and with them redstarts, myrtle and black-throated green warblers, almost all vastly changed in plumage from that of the spring. During this regime of over three weeks, flickers, sapsuckers, and an occasional robin visited the pool. It is amazing how much of a migration one may see from his window merely through the agency of an ordinary screen; I believe we have seen every conceivable method of taking a bath among birds, from the robin who wades in boldly and the waxwing who sometimes takes his bath on dry land from the splashings of others, to the kinglets whom I have seen hovering just under the drip cans on whirring wings, and taking a modern shower.

But gradually the parade of warblers passes, and the chickadees, downies, and nuthatches come in with the fall rainy season. October passes and with November come the first snow flurries; and by the middle of that month, one counts himself exceptionally favored if a warm-blooded junco decides to take a winter shower when the water is near freezing.

William J. Beecher

Program of Activities
of
The Chicago Academy of Sciences

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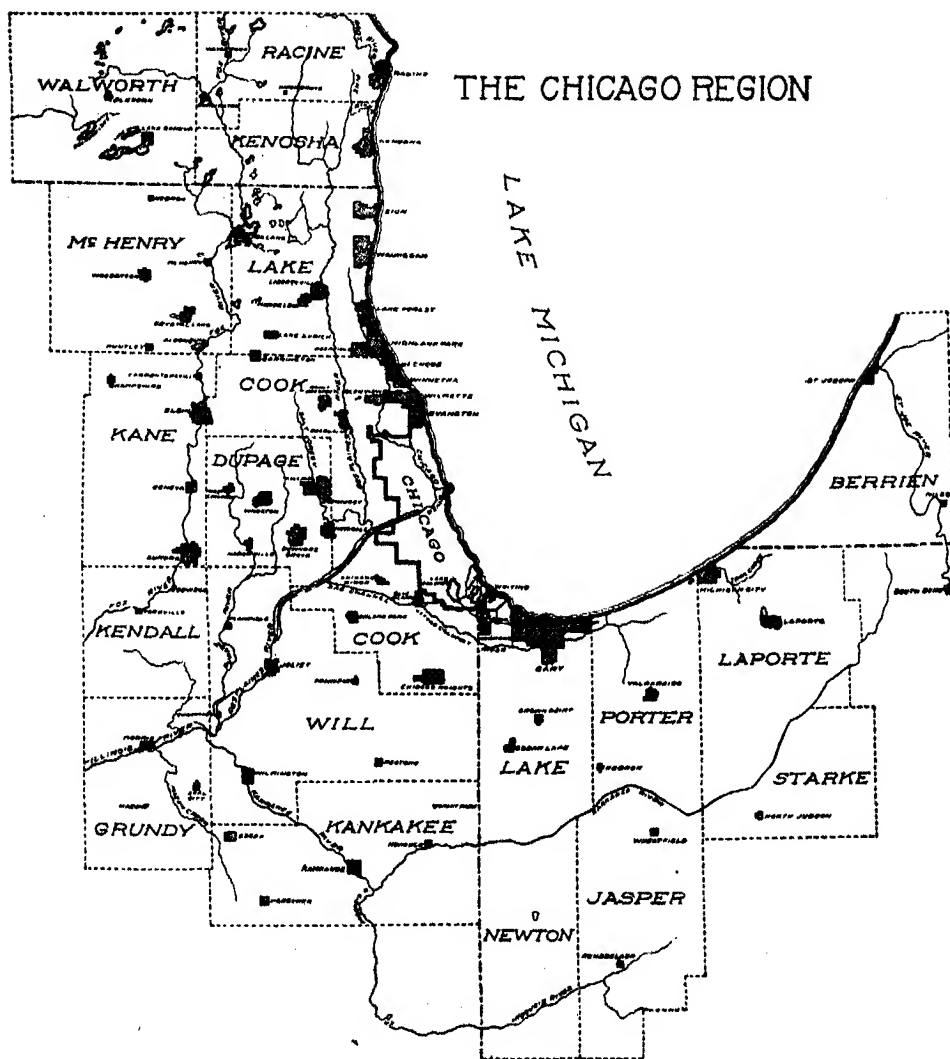
Nos. 2-3.

BIRDS
OF THE
CHICAGO REGION

BY

EDWARD R. FORD,
COLIN C. SANBORN, and C. BLAIR COURSEN

The Chicago Academy of Sciences
2001 NORTH CLARK STREET
CHICAGO



Map used through the courtesy of Karl P. Schmidt.

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BIRDS OF THE CHICAGO REGION

By Edward R. Ford, Colin C. Sanborn, and C. Blair Coursen

More than a quarter century ago, April 15, 1907, the Chicago Academy of Sciences issued bulletin six of the Natural History Survey, *The Birds of the Chicago Area*, by Frank Morley Woodruff. While a revision of this work is not among the Academy's present plans, the Academy believes it desirable to issue a digest of the ornithological records of the region as published in the available literature, and to incorporate data from the collections of the Academy and local ornithologists.

The region comprises the counties of Walworth, Racine, and Kenosha in Wisconsin; McHenry, Lake, Kane, Cook, DuPage, Kendall, Will, Grundy, and Kankakee in Illinois; Lake, Porter, LaPorte, Newton, Jasper, and Starke in Indiana; and Berrien in Michigan. The majority of the records are from Lake and Porter Counties, Indiana, and Cook and Lake Counties Illinois. Information on all species from the other counties is greatly needed. This territory exceeds in size that adopted by Woodruff, but in the introduction to his work, he included references to a number of extra-limital species occurring in the nearby region which, roughly, corresponds to that which has been added in making the present compilation.

While among observers there will be some question about the use of the terms "uncommon" and "rare" (these terms in general use being synonymous) it will be agreed that in ornithological works of reference it has been the custom to employ the latter word to imply a greater degree of rarity. Also there will be difference of opinion as to the status given many of the forms listed. This is to be expected but is unavoidable. It should be remembered that while the territory is relatively small, it is of markedly diversified character, and that a species quite common in one part of it might be considered rare with reference to the area in its entirety. In spite of these difficulties, a conscientious effort has been made to compile from the published records, and from material not heretofore published, a convenient reference list for the use of that by no means inconsiderable part of the local public which is interested in the status of local bird life.

The term **SUMMER RESIDENT** as used in the list, refers to forms indicated by the records as breeding or having bred in the area. It does not apply to a few species which frequently occur here in the summer but do not breed, such as some of the gulls, herons, and shore birds.

The term **WINTER VISITANT** as used in the list refers to species which occur mainly in winter. It should be noted however, that individuals of a species may migrate through the region during early winter while others remain in it. Examples are some of the gulls, diving birds, and waterfowl.

The term **PERMANENT RESIDENT** refers to species which are found regularly throughout the year and nest in the area. Again it should be observed that some individuals under this heading may migrate.

The term **MIGRANT** refers to forms which pass through the region to or from breeding grounds. Individuals may occasionally remain through part of the summer or winter.

Under **SPRING** and **AUTUMN** headings for migrants, dates labeled **VERY EARLY**, **EARLY**, and **AVERAGE** refer to time of arrival, while **LATE** refers to time of departure.

The asterisk (*) before the name of a species indicates one which should be excluded from a working list of the birds of the area. This includes extinct species formerly occurring, species of which there are only early records, extralimital forms unlikely to re-appear in numbers and species listed on the basis of sight records.

The authors realize that in including sight records in this list, they are open to criticism. This work, however, was intended not only as a list of the birds of our region, but as a record of papers which have dealt with the area under consideration. Many of the records which have been based on sight identification are undoubtedly due to error, and other rare casuals have been listed due to incorrect data. Many of Dr. Hoy's birds, for instance, were probably taken in areas far from Racine, although recorded as coming from there. Consequently, it must be remembered that the authors include sight records and these rare casuals in their proper sequence only for convenience.

It is probable that many water birds, such as Holboell's grebe, red-throated loon, the scoters, and the eiders, may be more plentiful in migration than the records show. It is well known that these birds are to be looked for well off shore. Hence a comparative few will be within the range of ordinary observation or the collector's gun. Also, the snow goose and blue goose probably pass through our region in considerable numbers, migrating at night and only being seen occasionally.

In a paper of this length, the authors have found it impossible to give individual credit for observation dates, but these observations were compiled over a period of years by the leading ornithologists of the Chicago region and were reported to the Chairman of the Report Committee of the Chicago Ornithological Society. We do wish to acknowledge our indebtedness to members of the Academy, the Chicago Ornithological Society, the Kennicott Club, the Illinois Audubon Society, and the staff of the Field Museum, who have aided in making this work possible.

We have not attempted to compile life history notes or identification charts, as such data is available elsewhere. We have tried to compile all published notes to date so that the oft repeated question, "How many and what birds are listed from the Chicago region?" may be answered, and to give at least one authority for the occurrence of unusual forms. We have included in this list 371 species and subspecies of which 92 marked with an asterisk are either rare or of doubtful occurrence. In general the first paragraph under each species gives its status, and references to published notes while the second paragraph gives migration and breeding date as compiled by Sanborn and Coursen.

Although the collections of the Academy (referred to by "C.A.S."), are most frequently alluded to, those of Field Museum of Natural History and of the N. W. Harris School Extension of Field Museum, as well as the following personal collections, have been used in the preparation of this report: the H. B. Conover collection at Field Museum, the collection of Daniel Crumlish at Wilmette, Illinois; the C. W. G. Eifrig collection at Concordia College, River Forest, Illinois; the S. S. Gregory Jr., collection at Winnetka, Illinois; the James J. Mooney collection at Highland Park, Illinois; the collection of Walter A. Weber at Highland Park, Ill.; and the collection of James S. White at Chicago.

Order **GAVIIFORMES.** Loons

COMMON LOON. *Gavia immer immer* (BRUENNICH).

A fairly common migrant and uncommon winter visitant. Woodruff (1907)¹ records it as having nested on Deer Lake, Lake Co., Ill., in May, 1892. Coale (1912) also refers to it as breeding on Sand Lake in the same county, but gives no date.

Spring: Mar. 16 (early); Apr. 8 (average); June 17 (late). Autumn: Aug. 26 (early); Oct. 1 (average); Nov. 19 (late). Winter: Dec. 25; Jan. 4; Feb. 22.

* **PACIFIC LOON** *Gavia arctica pacifica* (LAWRENCE).

According to Nelson (1876), this species was taken at Racine, Wis., but no date is given. Nelson's record refers to the black-throated loon (*Gavia arctica*), but according to the fourth edition of the A. O. U. Check List, the reported occurrence of that form in our region should be referred to *pacifica*.

RED-THROATED LOON. *Gavia stellata* (PONTOPPIDAN).

A fairly common winter visitant chiefly seen on Lake Michigan. There are records of several taken: one was secured at Waukegan Flats, Lake Co., Ill., April 14, 1928 (Stevenson, 1929); two are in the Academy's collection from Evanston, Cook Co., Ill., an immature taken February 15, 1885, and an unsexed adult secured by Dr. Oliver Marcy in the late '70's (C. A. S. 3769 and 5696).

Recent dates: Mar. 24, 1913; Feb. 21, 1914; Feb. 21, 1915; Apr. 22, 1921; Apr. 8-11, 1923; Apr. 14, 1928.

Order **COLYMBIFORMES.** Grebes

HOLBOELL'S GREBE. *Colymbus griseogen holboelli* (REINHARDT).

An uncommon but probably regular winter visitant. There is but little in the literature to indicate that this is other than a rare species in our region. Ford has seen it only once, in October, 1932, in a clay hole near Wheeling, Cook Co., Ill. It may be possible that in winter it occurs in some numbers on Lake Michigan. Nelson (1876) says it is rather uncommon on Lake Michigan. Butler (1897) cites a record from Wolf Lake, Lake Co., Ind., for the spring of 1883 and another from Park Side, Cook Co., Ill., April 28, 1883. Coursen photographed a bird in Jackson Park, Chicago, November 14, 1932.

Recent dates: Mar. 20, 1916; Nov. 11-21, 1920; Apr. 8, 1921; Oct. 23, 1927; Nov. 14, 1932.

HORNED GREBE *Colymbus auritus* LINNAEUS.

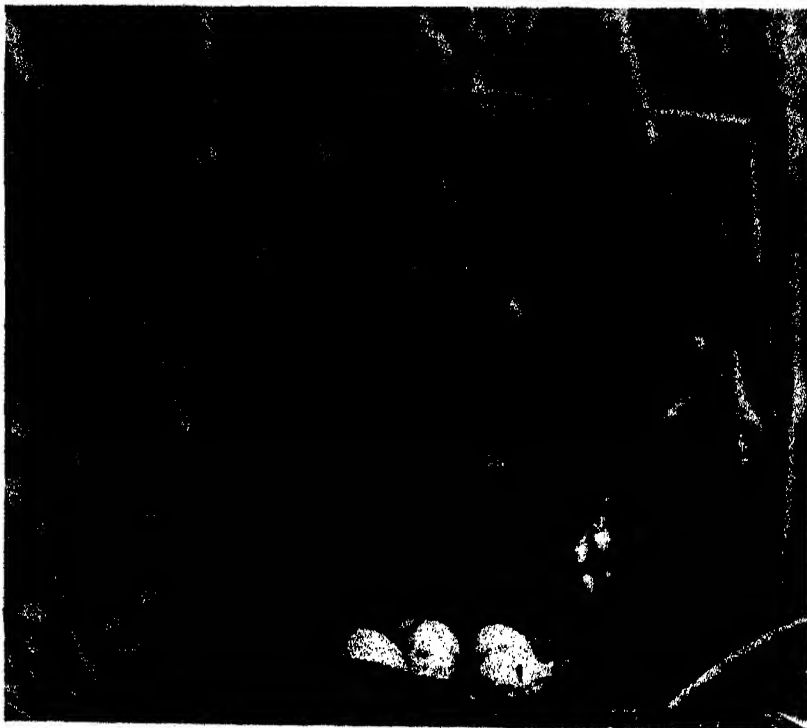
A common migrant; uncommon in winter. Downy young were taken in Lake Co., Ind., May 24, 1878, according to Butler (1897).

Spring: Mar. 31 (early); Apr. 6 (average); May 30 (late). Autumn: Sept. 6 (early); Oct. 1 (average); Nov. 29 (late). Winter: Dec. 18-31; Jan. 2-15; Feb. 22.

* **EARED GREBE** *Colymbus nigricollis californicus* (HEERMANN).

Formerly "not uncommon on Lake Michigan," (Nelson, 1876). A specimen (C. A. S. 2658) was taken at Chicago, November 3, 1888.

1. For complete citation see Bibliography at end of paper.



A. M. BAILEY

PIED-BILLED GREBE.

PIED-BILLED GREBE. *Podilymbus podiceps podiceps* (LINNAEUS).

A common summer resident breeding in the marshes throughout the area. Their dome-like nests are started with the first signs of growing marsh vegetation, and eggs are to be found in many by the first week in May.

Spring arrival: Mar. 3 (early); Mar. 28 (average). Breeding: May 16 to June 7, 1929, Homewood, Cook Co., Ill., many nests with eggs; May 12, 1930, Orland, Cook Co., Ill., 6 eggs; May 5, 1928, Hinsdale, Cook Co., Ill., 3 nests, 7, 7, 8 eggs; July 2, 1915, Butler Lake, Lake Co., Ill., 7 eggs. Autumn departure: Oct. 20 (average); Nov. 15 (late); Dec. 26, 1931 (very late).

Order **PELECANIFORMES.** Totipalmate swimmers

* **WHITE PELICAN.** *Pelecanus erythrorhynchos* GMELIN.

Of rare occurrence. One was taken in Chicago, April, 1903 (Woodruff, 1907) and another in Lake Co., Ill., in the spring of 1906 (Coale, 1912). A dead bird was picked up on the beach in Porter Co., Ind., Oct. 23, 1921 (Sanborn, 1922).

* **EASTERN BROWN PELICAN.** *Pelecanus o. occidentalis* LINNAEUS.

The only definite record for our area that we have been able to find is a specimen taken at St. Joseph, Berrien Co., Mich., June 7, 1904 (Barrows, 1912).

* **GANNET** *Morus bassana* (LINNAEUS).

Accidental in our region, there being but one recorded, a bird taken near Michigan City, La Porte Co., Ind., Nov. 1904 (Butler, 1906).

DOUBLE-CRESTED CORMORANT *Phalacrocorax auritus auritus* (LESSON)

A fairly common migrant; occasionally winters. Breeds south of our area in Illinois and north of it in Wisconsin. It is most frequently seen in migration along the shore of Lake Michigan, chiefly in April and May and in September and October. According to Nelson (1876), a Florida cormorant *Phalacrocorax auritus floridanus* (AUDUBON), was observed at Waukegan, Lake Co., Ill., in 1876, but this undoubtedly refers to the double-crested cormorant.

Spring: Apr. 2 (early); Apr. 16 (average); May 10 (late). Autumn: Sept. 1 (early); Oct. 15 (average); Nov. 21 (late).

Order **CICONIIFORMES**. Herons, storks, ibises, flamingos, and allies

GREAT BLUE HERON. *Ardea herodias herodias* LINNAEUS

Fairly common migrant, but not a common breeder in our region. Birds which probably nest in contiguous areas where colony isolation is more favorable are seen within our borders throughout the summer. Formerly it nested in numbers along the Kankakee and DesPlaines Rivers.

Spring: Mar. 23 (early); Apr. 6 (average). Breeding: June 26, 1932, 14 nests and June 18, 1933, 20 nests with young ready to fly, near Half Day, Lake Co., Ill. Autumn: Sept. 20 (average); Oct. 24 (late). Winter: Nov. 28, Dec. 14.

AMERICAN EGRET. *Casmerodius albus egretta* (GMELIN).

Casual late summer visitant. Formerly it occurred as a breeding species, nesting on the Kankakee River in northern Indiana in May, 1886 (Butler, 1897). Eggs were taken in Porter Co., Ind., May, 1895 (Woodruff 1907). Egrets have become more numerous in our area in recent years, due, no doubt, to increased protection in the south. Marshy areas near Orland, Cook Co., Ill., are favorite haunts of these handsome birds. There is a specimen in the Academy (3003) taken at Fox Lake, Lake Co., Ill., Oct. 5, 1880.

Autumn: July 26 (early); Aug. 15 (average); Sept. 17 (late).

* **SNOWY EGRET.** *Egretta thula thula* (MOLINA).

The only reference we can find to the occurrence of this species in our area is the following by Kennicott (1854) "Formerly occurred in Cook County, Illinois".

* **LOUISIANA HERON.** *Hydranassa tricolor ruficollis* (GOSSE).

Accidental. Butler (1897) says that one was identified in Starke Co., Ind., in June, 1876.

LITTLE BLUE HERON. *Florida caerulea caerulea* (LINNAEUS).

A not uncommon summer visitant. This species, in the white, immature plumage, is frequently seen with the American egret in the late summer in marshy areas throughout our region. It is rather regular in its occurrence, but it is not common. Three specimens, all females, were taken at Hinsdale, DuPage Co., Ill., Aug. 15, 1930 (C. A. S. 4072-3-4). Birds in the adult blue plumage are rarely seen.



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LEAST BITTERN.

Recent dates: May 9, 1921, Chicago; Aug. 15, 1926, Beach (Waukegan) Lake Co., Ill.; Aug. 24, 1930, Lake Co., Ill.; Sept. 10, 1930, McHenry Co., Ill.; Aug. 1, 1930, Orland, Cook Co., Ill.

EASTERN GREEN HERON. *Butorides virescens virescens* (LINNAEUS).

A common summer resident which begins to nest about the middle of May.

Spring arrival: Apr. 9 (early); Apr. 25 (average). Breeding: May 21, 1916, Willow Springs, Cook Co., Ill., eggs; June 2, 1930, Oakwood Cemetery, Chicago, 4 eggs; May 26, 1931, Orland, Cook Co., Ill., 6 eggs; June 2, 1933, Palos Park, Cook Co., Ill., 5 newly hatched young. Autumn departure: Sept. 20 (average); Oct. 12 (late).

BLACK-CROWNED NIGHT HERON. *Nycticorax n. hoactli* (GMELIN).

A common summer resident. There are records of nesting colonies in Cook, Lake, DuPage, and McHenry Counties, Illinois at intervals from 1909 to 1933. Nesting begins about May 1.

Spring arrival: Mar. 5 (early); Apr. 10 (average). Breeding: May 19, 1921, colony of about 250 nests, Lake Co., Ill.; May 12, 1930, Will Co., Ill., 9 nests, 1 to 6 eggs. Autumn departure: Oct. 5 (average); Nov. 19 (late). Winter: Jan. 4.

* **YELLOW-CROWNED NIGHT HERON:** *Nyctanassa v. violacea* (LINNAEUS).

Rare in our region. One was seen in Jackson Park, Chicago, April 14, 1918 (Leopold, 1918), and there is a skin in the N. W. Harris Extension Collection of Field Museum, taken at Illinois, Kankakee Co., Ill., Apr. 3, 1921.

AMERICAN BITTERN. *Botaurus lentiginosus* (MONTAGU).

Common summer resident. There are many breeding records. Full sets of eggs may be looked for about May 20.

Spring arrival: Mar. 21 (very early); Apr. 7 (early); Apr. 20 (average). Breeding: June 1, 1931, Orland, Cook Co., Ill., 4 eggs; June 2, 1918, Gray's Lake, Lake Co., Ill., eggs (C.A.S.); May 19, 1932, Deerfield, Lake Co., Ill., 2 nests, 4, 5 eggs. Autumn departure: Oct. 20 (average); Nov. 17 (late). Winter: Feb. 11, 1913.

EASTERN LEAST BITTERN. *Ixobrychus exilis exilis* (GMELIN).

A common summer resident. Cory's least bittern (*Ixobrychus neoxenus*), now regarded as a color phase of the eastern least bittern, was taken at Cary, McHenry Co., Ill., May 23, 1914 (Eifrig, 1915).

Spring arrival: Apr. 27 (early); May 12 (average). Breeding: June 7-9, 1929, Homewood, Cook Co., Ill., 7 nests 3 to 6 eggs; May 30, 1931, Orland, Cook Co., Ill., 5 eggs; July 13, 1928, LaGrange, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 6 (average); Sept. 25 (late).

* **WOOD IBIS.** *Mycteria americana* LINNAEUS

This species is given a place in our list solely because, according to Nelson (1876), one was taken at Racine, Racine Co., Wis., Sept. 10, 1869.

* **EASTERN GLOSSY IBIS.** *Plegadis falcinellus falcinellus* (LINNAEUS).
"Formerly rare visitant" (Nelson, 1876) is the only mention of the species.

Order **ANSERIFORMES.** Swans, geese, and ducks

WHISTLING SWAN. *Cygnus columbianus* (ORD).

Rare migrant and winter visitant. One was taken in Lake Co., Ill., Nov. 22, 1906 (Daggett, 1907), and two were taken in Cook Co., Ill., in April, 1916, (Coale, 1926); a pair of birds of the year were taken at Waukegan, Lake Co., Ill., Nov. 8, 1933 (one is C. A. S. 6361, the other is in possession of W. I. Lyon). One or two have been present each year during several recent winters, on a pond near Waukegan.

Recent dates: Apr. 2, 1923, Orland, Cook Co., Ill.; Apr. 14, 1927, Beach (Waukegan), Lake Co., Ill.; Oct. 20, 1931 to Mar. 20, 1932, Waukegan, Lake Co., Illinois. ..

* **TRUMPETER SWAN.** *Cygnus buccinator* RICHARDSON.

Probably extinct in our region. A specimen was taken in Lake Co., Ind., in the spring of 1882 and one in Porter Co., Ind., February 22, 1894 (Butler, 1897).

COMMON CANADA GOOSE. *Branta canadensis canadensis* (LINNAEUS).

Common migrant and less common winter visitant. Reported as breeding in LaPorte Co., Ind., no date given, by Butler (1897); young were seen on Calumet Lake, Cook Co., Ill., June 23, 1877 (Woodruff, 1907), and Coale (1912) reports it as breeding in Lake Co., Ill., about 1892. It is certain that in the vicinity of Chicago, at least, the number of geese observed in migration represents a lamentable reduction in the flocks as they were to be seen twenty-five years ago.

Autumn arrival: Sept. 24 (early); Oct. 15 (average). Winter: Dec. 15; Jan. 10; Feb. 6. Spring departure: Apr. 10 (average); Apr. 23 (late); May 1 (very late).

HUTCHINS'S GOOSE. *Branta canadensis hutchinsi* (RICHARDSON).

A rare migrant. For Delavan, Walworth Co., Wis., Oct. 12 is given as early fall migration date (Bent, 1925). The only record we have of a specimen being taken is that of one from DuPage Co., Ill., Nov. 11, 1911, and reported by Eifrig (1913) as the cackling goose, *Branta c. minima*. The status of the various races of geese has not been worked out satisfactorily for our region, and sportsmen who secure specimens, could do a great service by sending their small geese to the Academy for determination.

* **AMERICAN BRANT.** *Branta bernicla hrota* (MUELLER).

This species is included in our list only on the basis of the report of Nelson (1876) that it was "taken near Racine, Wisconsin." No date is given, and this, like many other early records, has not been substantiated by specimens taken in later years.

* **WHITE-FRONTED GOOSE.** *Anser albifrons albifrons* (SCOPOLI).

A rare migrant. According to Woodruff (1907) this goose was formerly common. However, specific records of its capture in our area are lacking, and again we should like to emphasize the service which sportmen could render naturalists by submitting their bags for identification.

LESSER SNOW GOOSE. *Chen hyperborea hyperborea* (PALLAS).

A rare migrant. Formerly, according to Woodruff (1907), it was a common migrant. It is reported as having been taken in LaPorte Co., Ind., March 30, 1896 (Butler, 1897). Brodtkorb (1928a) writes of two shot along Lake Michigan in our area Oct. 29-30, 1928. The Eifrig collection contains a skin taken in DuPage Co., Ill., Nov. 15, 1914. Dr. W. A. Mann, of Chicago, who for many years (1895 to 1920) shot wildfowl in Lake and McHenry Counties, Ill., has killed snow geese there only once. Birds formerly reported as greater snow geese refer to this form as the greater snow goose is only found on the Atlantic seaboard.

Recent dates: Oct. 21, 1916, Gary, Ind.; Oct. 29, 1927, Beach (Waukegan), Lake Co., Ill.; Oct. 23, 1932, Lincoln Park, Chicago; Oct. 20, 21, 22, and 23, 1933, Chicago.

BLUE GOOSE. *Chen caerulescens* (LINNAEUS).

An uncommon migrant. Common formerly, when many were taken in the Calumet marshes. There is an adult in the Academy collection (4232) from Geneva, Kane Co., Ill., taken Apr. 1, 1886.

Recent dates: Oct. 21, 1916, Gary, Ind.; Oct. 23, 1922, Lincoln Park, Chicago; Mar. 31, 1928, Wolf Lake, Cook Co., Ill.; Mar. 20, 1932, Jackson Park, Chicago; Oct. 21, 1933, Calumet Lake, Cook Co., Ill.

* **FULVOUS TREE DUCK.** *Dendrocygna b. helva* WETMORE AND PETERS.

A bird of this southwestern species was taken off the Government Navy Pier, Chicago, Dec. 7, 1919 (Moyer, 1931). Although there are records from Iowa and Missouri, there is a good reason for supposing this bird to have been an escape.

COMMON MALLARD. *Anas platyrhynchos platyrhynchos* LINNAEUS.

Permanent resident, most common in spring and fall. Many free-flying birds nest on a little island in a lagoon in Lincoln Park, Chicago, and free-flying birds are occasionally seen in Graceland Cemetery, Chicago, where a pair has nested for some years. We have been able to find only six published breed-

ing records from this region of birds nesting in a natural setting.

Breeding: July 2, 1915, Butler's Lake, Lake Co., Ill., eggs just hatching; May 17, 1923, 4 eggs; May 26, 1929, Homewood, Cook Co., Ill., 11 eggs.

RED-LEGGED BLACK DUCK. *Anas rubripes rubripes* BREWSTER

This form of the black duck, first described by William Brewster (1902), was admitted to a place in the A. O. U. Check List for 1931. Earlier references to black ducks in our area for which there are no specimens available are sub-specifically of no value. However, there is one specimen of this race in the Academy collection, (4300), taken at Liverpool, Lake Co., Ind., Sept. 4, 1906.

Spring: Mar. 9 (early); May 5 (late); Summer: July 29 and Aug. 19, 1928. Autumn: Nov. 25 (late). Note: In compiling these records no attempt was made to differentiate between *Anas r. rubripes* and *Anas r. tristis*.

COMMON BLACK DUCK. *Anas rubripes tristis* BREWSTER

An uncommon migrant, casual in summer. Nelson (1876) says that two pairs nested each year in the Calumet marshes, Cook Co., Ill. As in the case of other wildfowl by general report considered common in this region, specific data is lacking. In a list of "recoveries" of Black Ducks banded by Dr. K. Christofferson, Chippewa County, Michigan, two refer to our area. One was shot Oct. 6, 1929 in La Porte Co., Ind., and another was secured Oct. 31, 1931 in Walworth Co., Wis. It is not known whether the records here presented refer to this or the preceding form. However, Stoddard (MS. 1920) says "the duck seems nearly as common as the mallard in the Dunes [Lake and Porter Counties, Indiana]."

GADWALL. *Chaulelasmus streperus* (LINNAEUS).

An uncommon migrant. Nelson (1876) regarded this species as a rare summer resident. It was a common migrant formerly and a few are taken each season along the Illinois and Kankakee Rivers, but definite records are not numerous. There is a skin, (C. A. S. 2705) taken at Calumet Lake, Cook Co., Ill., Oct., 1926.

Recent dates: Apr. 3 and 12, 1921; Mar. 17, 1922; Oct. 18, 1927; Apr. 25, 1928; May 12, 1928; Mar. 30, 1930; Apr. 4 and 16, 1931; Apr. 30, 1932.

EUROPEAN WIDGEON. *Mareca penelope* (LINNAEUS).

A rare visitant. About ten specimens taken in our area have been recorded. The latest was secured in Lake Co., Ill., Apr. 1, 1904 (Deane, 1905). Lewy (1930) reported a bird seen on Wolf Lake, Cook Co., Ill., Apr. 17, 1930. Another was observed in Jackson Park, Chicago, Apr. 11 and 12, 1930.

BALDPATE. *Mareca americana* (GMELIN).

Common migrant. A female and young were reported seen in Starke Co., Ind., in the summer of 1897 (Butler, 1897).

Spring: Feb. 20 (very early); Mar. 4 (early); Apr. 5 (average); May 18 (late); June 9 (very late); Autumn: Sept. 15 (early); Sept. 25 (average); Nov. 29 (late).

AMERICAN PINTAIL. *Dafila acuta tzitzilhoa* (VIEILLOT).

A common migrant but a rare summer resident. Nelson (1876) refers to a nest and eggs found at Calumet Lake, Cook Co., Ill., May 29, 1875. Hollister (1919) writes that fully fifty birds were reared not over seven miles from Delavan, Walworth Co., Wis., in 1918.

Spring: Feb. 17 (very early); Mar. 10 (average); June 4 (late). Autumn Sept. 7 (early); Oct. 1 (average); Nov. 12 (late).

GREEN-WINGED TEAL. *Nettion carolinense* (GMELIN).

Uncommon migrant. Nelson (1876) regarded it as a rare summer resident and Coale (1912) says it breeds in Lake Co., Ill., but is not specific.

Spring: Mar. 4 (early); Mar. 28 (average); Apr. 30 (late); May 31 (very late). Autumn: Sept. 22 (early); Oct. 10 (average); Nov. 12 (late).

BLUE-WINGED TEAL. *Querquedula discors* (LINNAEUS).

A common migrant and a fairly common summer resident. A nesting record we have refers to a nest and eleven eggs at Wolf Lake, Cook Co., Ill., [or Lake County, Indiana], June 2, 1926 (Bodenstein, 1930). Ford found a nest and ten eggs at Chicago Ridge, Cook Co., Ill., May 23, 1912, and Stoddard (MS. 1920) says that he found a nest at Chicago Ridge, May 31, 1920, which also contained ten eggs.

Spring arrival: Mar. 20 (early); Apr. 6 (average). Breeding: June 2, 1918, Wolf Lake, Cook Co., Ill., 12 eggs; July 12, 1927, Warrenville, DuPage Co., Ill., just hatching; May 21, 1932, Orland, Cook Co., Ill., 11 eggs. Autumn departure: Oct. 20 (average); Nov. 19 (late); Dec. 1 (very late).

* **CINNAMON TEAL.** *Querquedula cyanoptera* (VIEILLIOT).

Accidental. This western species has been reported as occurring on two occasions at Lake Koshkonong, Jefferson Co., Wis., just outside our limit. Brodtkorb reported (1926a) this species from Hammond, Lake Co., Ind. No specimens have been taken in our area.

SHOVELLER. *Spatula clypeata* (LINNAEUS).

Fairly common migrant; uncommon summer resident. Butler (1897) records a nest and eggs taken in Starke Co., Ind., May 4, 1890. There is a set of eggs in the Academy collection taken in Cook Co., Ill., June 7, 1890.

Spring: Mar. 16 (early); Apr. 5 (average); May 31 (late). Breeding: June 4, 1932, McGinnis Slough, Orland, Cook Co., Ill., 9 eggs ready to hatch. Autumn: Sept. 12 (early); Oct. 18 (average); Nov. 17 (late). Winter: Dec. 5, 1920.

WOOD DUCK. *Aix sponsa* (LINNAEUS).

Rare summer resident. Butler (1897) gives a breeding note from Starke Co., Ind., July 29, 1889. This is a species which apparently is responding to protection, and probably will become a more common summer resident. Many are now seen upon the lakes at the beginning of the hunting season—especially upon Grass and Fox Lakes, Lake Co., Ill.

Spring arrival: Mar. 12 (early); Apr. 1 (average). Breeding: July 11, 1930, Orland, Cook Co., Ill., 8 half-grown young. Autumn departure: Oct. 20 (average); Nov. 6 (late). Winter: Dec. 18, 1923.

REDHEAD. *Nyroca americana* (EYTON).

A fairly common migrant. Butler (1897) gives March 4 as the earliest spring date for English Lake, Starke Co., Ind., and May 10 as the latest. Bent (1923) gives March 10 as an early date for southern Wisconsin. Cory (1909) considered the species common in Illinois and Wisconsin, and Woodruff (1907) says that formerly Wolf Lake and George Lake, Lake Co., Ind., were favorite feeding grounds. There seems to be a scarcity of local specimens in collections.

Spring: Mar. 6 (early); Mar. 16 (average); Apr. 26 (late). Autumn: Sept. 19 (early); Oct. 17 (average); Nov. 20 (late).

RING-NECKED DUCK. *Nyroca collaris* (DONOVAN).

Fairly common migrant. Possibly more numerous than is apparent because it is apt to be mistaken for the lesser scaup duck. Nelson (1876) said it breeds in our region. A skin in the Conover collection was taken in DuPage Co., Ill., March 20, 1921. Eifrig has a specimen taken at Wilmette, Cook Co., Ill., March 26, 1915, and there are several in the Academy collection, the latest a female taken at Lemont, Cook Co., Ill., October 31, 1933 (C. A. S. 6348).

Spring: Feb. 22 (very early); Mar. 1 (early); Mar. 15 (average); May 24 (late). Autumn: Oct. 6 (early); Oct. 16 (average); Nov. 29 (late); Dec. 3 (very late). Winter: Dec. 23, 1921; Jan. 29, 1929.

CANVAS-BACK. *Nyroca valisineria* (WILSON).

Uncommon migrant. It is now much reduced in its numerical status as compared with earlier years. Butler (1897) says, "It is quite abundant at Fox Lake" Lake and McHenry Cos., Ill. He says, however, referring to English Lake, Starke Co., Ind., "at that place it is not abundant." Cory (1909) says "still common in migration in both Illinois and Wisconsin." There is a male in the Academy collection (1659) taken March 9, 1887, at Liverpool, Lake Co., Ind.

Spring arrival: Mar. 9 (early); Apr. 24 (late). Autumn: Oct. 25 (early); Nov. 27 (late). Winter: Feb. 9, 1921.

GREATER SCAUP DUCK. *Nyroca marila* (LINNAEUS).

An uncommon migrant. Eifrig has a specimen taken in Chicago, March 20, 1914, and a skin in the Academy collection (2684), was taken in Chicago, October 15, 1914. Hollister (1920) in a record of 1167 wild ducks killed at Delavan, Walworth Co., Wis., 1892 to 1899, lists twenty of this species.

Local records are too few to permit the listing of early, average, and late dates. It is probably safe to assume that this bird leaves earlier in the spring and stays later in the autumn than the lesser scaup duck.

LESSER SCAUP DUCK. *Nyroca affinis* (EYTON).

A common migrant, and uncommon winter visitant. Nelson (1876) regarded it as a not uncommon summer resident. A brood of young was seen, according to Butler (1897), at English Lake, Starke Co., Ind., in June, 1886. Coale (1912) records that it was found breeding in Lake Co., Ill., on two occasions, but gives but one date, viz., June, 1909.

Autumn arrival: Sept. 5 (very early); Oct. 2 (early); Oct. 16 (average). Winter: Nov. 30; Dec. 25; Jan. 10; Feb. 5. Spring departure: Apr. 30 (average); June 5 (late). Summer (probably non-breeding birds): June 30; July 10; Aug. 2 and 13.

AMERICAN GOLDEN-EYE. *Glaucionetta clangula americana* (BONAPARTE).

A common winter visitant. This is one of the common ducks observed along Lake Michigan during the winter months. There is an immature male in the Academy collection (2690), taken in Cook Co., Ill., on January 21, 1875.

Autumn arrival: Oct. 14 (early); Nov. 1 (average). Spring departure: Apr. 15 (average); May 13 (late).

BARROW'S GOLDEN-EYE. *Glaucionetta islandica* (GMELIN).

A rare winter visitant. One was taken in McHenry Co., Ill., January 2, 1889 (Butler, 1897) and two were taken off Lincoln Park, Chicago, December 11, 1896 (C. A. S. 1656). Ford (1933) reports that one was seen by Daniel Crumlish, off Wilmette in Cook Co., Ill., winter 1932-33.

BUFFLE-HEAD. *Charitonetta albeola* (LINNAEUS).

A fairly common migrant. They were formerly abundant, but now, like the majority of our waterfowl, have been reduced in numbers. They are often seen upon Lake Michigan and the smaller lakes.

Spring: Feb. 24 (very early); Mar. 9 (early); Apr. 5 (average); Apr. 27 (late). Autumn: Oct. 9 (early); Oct. 30 (average); Nov. 28 (late). Winter: Dec. 21 and 27; Jan. 16 and 25.

OLD SQUAW. *Clangula hyemalis* (LINNAEUS).

This is one of the most common of our wintering waterfowl, being numerous on Lake Michigan

Autumn arrival: Oct. 1 (early); Nov. 12 (average). Spring departure: Apr. 1 (average); Apr. 25 (late); May 8 (very late).

* **EASTERN HARLEQUIN DUCK.** *Histrionicus h. histrionicus* (LINNAEUS).

A rare visitor. One was taken at Racine, Wisconsin, (Nelson 1876). According to Barrows (1912) "Gibbs says one was shot on Lake Michigan near Chicago [no date] and is now in the collection of the Chicago Academy of Sciences." We are not able to locate the specimen; Woodruff did not mention the bird, so no doubt it was lost at an early date.

* **AMERICAN EIDER.** *Somateria mollissima dresseri* SHARPE

A rare winter visitant. Nelson (1876) reports that one was taken near Chicago in 1874. Another was taken off Jackson Park, Chicago, December 1, 1908 (Devine, 1909), and is now in the Gregory collection.

* **KING EIDER.** *Somateria spectabilis* (LINNAEUS).

A rare winter visitant. Several were taken off the Navy Pier, Chicago, November 29, 1917 (Elfrig, 1919). It is possible that some of these waterfowl which we now consider rare, may prove to be more common far offshore on Lake Michigan.

WHITE-WINGED SCOTER. *Melanitta deglandi* (BONAPARTE).

An uncommon winter visitant. There is a skin in the Academy collection (6032) taken off the Navy Pier, Chicago, in the winter of 1925.

Autumn arrival: Oct. 20 (early). Winter: Nov. 25; Dec. 19; Jan. 9, 12, 20, and 30; Feb. 6 and 28. Spring departure: Apr. 10 (average); Apr. 24 (late).

* **SURF SCOTER.** *Melanitta perspicillata* (LINNAEUS).

A rare migrant. It was taken on the Calumet marshes in Cook Co., Ill., in the fall of 1875 (Nelson, 1876). Hollister (1920) lists three surf scoters killed at Delavan Lake, Walworth Co., Wis., from 1892 to 1899.

AMERICAN SCOTER. *Oidemia americana* SWAINSON

A rare winter visitant. There are few definite records from this locality. One specimen (C.A.S. 5702), was taken at Evanston, Cook Co., Ill., prior to 1883, and another was taken off Wilmette, Cook Co., Ill., November 26, 1932, by Daniel Crumlish, and is in his collection. James Mooney found one at Fort Sheridan, Lake Co., Ill., December 4, 1929, which was too badly decomposed to preserve, and Hollister (1920), lists six of this species killed at Delavan Lake, Walworth Co., Wis., from 1892 to 1899.

RUDDY DUCK. *Erismatura jamalcensis, rubida* (WILSON).

An uncommon migrant and rare summer resident. While these birds are not abundant, they are often seen during the hunting season. There are several

references to their breeding in our area. Birds with full grown young were seen at Waukegan, Lake Co., Ill., in mid-September, 1875 (Nelson, 1876), and Coale (1912) states they were breeding at Butler's Lake, Lake Co., Ill., no date given. A female with six small young was seen at Lake Calumet, Cook Co., Ill., July 23, 1927 (Stevenson and Brodkorb, 1933). The latest of four specimens (C. A. S., 2695) was taken at Lake Zurich, Lake Co., Ill., in 1907.

Spring: Feb. 26 (very early); May 30 (early); Apr. 9 (average); May 21 (late). Autumn: Oct. 6 (early); Oct. 20 (average); Nov. 12 (late). Winter: Dec. 25, 1932.

HOODED MERGANSER. *Lophodytes cucullatus* (LINNAEUS).

A fairly common migrant and rare summer resident. Woodruff (1907) states that it bred abundantly along the Kankakee River, and Coale (1912) reported it as nesting in Lake Co., Ill., in May 1909. It is surprising to note that Hollister (1920) found that 13% of the 1167 birds taken by sportsmen on Delavan Lake, Walworth Co., Wis., 1892 to 1899 were hooded mergansers.

Spring: Mar. 1 (early); Apr. 10 (average); June 5 (late). Summer: July 17-25, 1922; Aug. 1. Autumn: Sept. 10 (early); Oct. 15 (average); Nov. 16 (late). Winter: Dec. 8 and 21; Jan. 5.

AMERICAN MERGANSER. *Mergus merganser americanus* CASSIN.

A common winter visitant; found chiefly on Lake Michigan. Taken February 12, 1891, at English Lake, Starke Co., Ind., (Butler, 1897).

Autumn arrival: Oct. 20 (early); Nov. 1 (average). Spring departure: Apr. 15 (average); May 8 (late); May 18 (very late).

RED-BREASTED MERGANSER. *Mergus serrator* LINNAEUS.

A common migrant and winter visitant. This species is probably more abundant and is more often seen along the rivers than the preceding species.

Autumn arrival: Sept. 10 (very early); Oct. 1 (early); Oct. 25 (average). Spring departure: May 7 (average); May 25 (late).

Order **FALCONIFORMES** Birds of prey

TURKEY VULTURE. *Cathartes aura septentrionalis* WIED.

An uncommon visitant. This wanderer from the south has been recorded each month of the year, although most records are for April and May. One was taken at Calumet Lake, Cook Co., Ill., May 3, 1899 (Coale, 1925). Another is recorded taken in Cook Co., Ill., May, 1926 (Coale, 1926). There is a specimen in the Academy collection (2855) taken by Robert Kennicott at West Northfield, Cook Co., Ill., about 1859.

* **BLACK VULTURE.** *Coragyps atratus atratus* (MEYER).

Accidental. Our only record is of a dead bird found in Lake Co., Ill., November 18, 1909 (Coale, 1912).

* **SWALLOW-TAILED KITE.** *Elanoides forficatus forficatus* (LINNAEUS).

Accidental. It was found nesting near Racine, Wisconsin, in 1848 (Cory, 1909). Woodruff (1907) refers to a specimen taken in Lake Co., Ill., June 5, 1895 and to three taken in the same county in April, 1905. There have been no specimens taken in recent years, but Miss Belle Wilson observed one at Tremont, Porter Co., Ind., April 5, 1921.

EASTERN GOSHAWK. *Astur atricapillus atricapillus* (WILSON).

An irregular winter visitant. There are records of several from the locality; Woodruff (1907) mentions having collected one male at Beverly Hills, Chicago, March 30, and Eifrig (1919) states that Mr. Karl Kahman, a taxidermist, had received between thirty and forty specimens in the years 1915 and 1916. One in the Eifrig collection was taken at Orland, Cook Co., Ill., October 28, 1916. There is a skin in the Academy collection (3746) taken in Cook Co., Ill., by G. E. Clifford, in 1860.

Earliest autumn date: Oct. 28, 1916. Latest spring date: March 3, 1933.

SHARP-SHINNED HAWK. *Accipiter velox velox* (WILSON).

A fairly common migrant and rare resident. This species is seen rather regularly during migration. Butler (1897) records that eggs were found in Lake Co., Ind., April 17, 1886. This would seem to be a mistake, as the species normally breeds in May and June. There are eight skins from the Chicago area in the Academy collection, all taken in the fall.

Spring arrival: March 19 (early); April 16 (average). Breeding: No definite records. Autumn departure: Oct. 18 (average); Nov. 30 (late). Winter: Dec. 8; Jan. 27; Feb. 8 and 14.

COOPER'S HAWK. *Accipiter cooperi* (BONAPARTE).

A fairly common summer resident, nesting in May. Breeding records from various sources, eggs in the Academy collection, and our notes show this to be fairly common as a nesting species although less common than formerly. Eifrig (1918) records three nests found in Porter Co., Ind., in 1914, 1915, and 1916. There are five skins in the Academy series from this area.

Spring arrival: Mar. 4 (early); Mar. 18 (average). Breeding: May 9, 1915, Highland Park, Lake Co., Ill., 1 egg; May 21, 1916, Porter Co., Ind., 4 eggs. Autumn departure: Nov. 10 (average); Dec. 1 (late). Winter: Dec. 28; Jan. 26 and 31; Feb. 17.

EASTERN RED-TAILED HAWK. *Buteo borealis borealis* (GMELIN).

A fairly common resident; nests in March and April. There are several specimens from the region in the Academy collection.

Breeding: Apr. 16, 1916, Half Day, Lake Co., Ill., 3 eggs; Mar. 30, 1929, Cook Co., Ill., 2 eggs; Apr. 4, 1931, La Grange, Cook Co., Ill., 3 eggs; Apr. 23, 1933, Walworth Co., Wis., nest with young.

* **WESTERN RED-TAILED HAWK.** *Buteo borealis calurus* CASSIN.

One record has been published. Nelson (1876) reports one taken near Chicago, April, 1873.

* **KRIDER'S HAWK.** *Buteo borealis krideri* HOOPES.

Accidental. This subspecies is included on the basis of one specimen taken in Lake County, Illinois, July 25, 1876 (Coale, 1885).

* **HARLAN'S HAWK.** *Buteo borealis harlani* (AUDUBON).

Accidental. Listed on the authority of Woodruff (1907) who reports a specimen secured at Calumet Lake, Cook Co., Ill., October 1, 1895.

NORTHERN RED-SHOULDERED HAWK. *Buteo lineatus lineatus*

A common summer resident; nests in April. This is probably the most common of our breeding hawks and still nests in the region in spite of hunters.



RED-SHOULDERED HAWK

Breeding: Apr. 6, 15, and 29, 1915, eggs, May 22, 1922, 4 young, near Half Day, Lake Co., Ill.; Apr. 12, 1930, Palos Park, Cook Co., Ill., 5 eggs.

BROAD-WINGED HAWK. *Buteo platypterus platypterus* (VIEILLLOT).

A fairly common migrant, but a rare summer resident. Eggs were taken in Will Co., Ill., May 10, 1906 (Cory, 1909).

Spring arrival: Mar. 29 (early); Apr. 18 (average). Autumn departure: Oct. 10 (average); Nov. 11 (late); Dec. 8, 1924 (very late).

* **SWAINSON'S HAWK.** *Buteo swainsoni* BONAPARTE.

This western species has been taken twice in Lake Co., Ill.,—October 13, 1914 (Coale, 1916) and October 27, 1918 (Eifrig, 1919).

ROUGH-LEGGED HAWK. *Buteo lagopus s.—johannis* (GMELIN).

Fairly common winter visitant. This beneficial species is seen regularly throughout the winter months. A live bird was brought into the Academy November 20, 1933, which had been winged by hunters near Harvey, Cook Co., Ill. After the wing had mended, the bird was banded by Mr. W. I. Lyon and liberated.

Autumn arrival: Sept. 28 (early); Oct. 25 (average). Winter: There are records in recent years for the months from November to February. Spring departure: Mar. 25 (average); Apr. 30 (late).

* **GOLDEN EAGLE.** *Aquila chrysaetos canadensis* (LINNAEUS).

Dr. Hoy (1852) records a nest near Racine, Wisconsin; Nelson (1876) says one was taken near Chicago, December, 1874, and that the birds formerly

nested throughout the state, and Coale (1912) reports that one was secured in Lake Co., Ill., in June, 1907. One was shot near Niles, Cook Co., Ill., in November, 1933, by hunters, and its picture shown in the Chicago Tribune.

SOUTHERN BALD EAGLE. *Haliaeetus l. leucocephalus* (LINNAEUS).

A rare resident. This species still occurs occasionally, and several have been taken. The latest of which we have record, however, was secured near Deerfield, Lake Co., Ill., May 15, 1928. A nest was reported in Lake Co., Ill., "some years before 1875" (Coale, 1912), and a nesting is recorded at Millers, Lake Co., Ind., in the spring of 1897 (Woodruff, 1907). Woodruff reported two other nests from Kouts, Porter Co., Ind., in the spring of 1896. Of recent years we have records of birds seen on Feb. 24, 1924, Dec. 2 and 19, 1928, and Jan. 30, 1930.

MARSH HAWK. *Circus hudsonius* (LINNAEUS).

Permanent resident, more abundant in summer. The Academy's collection contains a set of eggs taken at Delavan, Walworth Co., Wis., June 1, 1929.

Spring: Mar. 1 (early); Mar. 25 (average). Breeding: May 4, 1916, Highland Park, Lake Co., Ill., 2 eggs; May 12, 1930, Tremont, Porter Co., Ind., 5 eggs; June 12, 1930, Beach (Waukegan), Lake Co., Ill., 4 eggs. Autumn: Oct. 20 (average); Nov. 6 (late). Winter: Nov. 30; Dec. 6, 17, and 25; Jan. 8 and 22; Feb. 3 and 26.

OSPREY. *Pandion haliaetus carolinensis* (GMELIN).

An uncommon migrant. Two were taken in Cook Co., Ill., in the spring of 1926 and another (C.A.S. 4158) Sept., 1928. On Sept. 18, 1930 one (C.A.S., 2670) was shot at Camp Lake, Racine Co., Wis. Ford saw one over the Calumet "feeder," Chicago Ridge, Cook Co., Ill., May 15, 1894.

Spring: Apr. 8 (early); May 25 (late). Breeding: No definite records. Said to nest near Kouts, Lake Co., Ind. Autumn: Sept. 3 (early); Oct. 20 (late).

* **PRAIRIE FALCON.** *Falco mexicanus* SCHLEGEL.

One was reported seen by G. P. Lewis in the Calumet region, May 4, 1930 (White, 1930).
1926; Oct. 7, 1927.

DUCK HAWK. *Falco peregrinus anatum* BONAPARTE.

An uncommon migrant. Nelson (1876) regarded it as "formerly a rare summer resident." One was taken in the Calumet region, Sept. 29, 1899. Three were taken in Lake and Cook Counties, Illinois, September, 1911 (Woodruff, 1912). There are three specimens from the area in the Academy collection and Mr. Eifrig has one taken in Cook Co., Ill., October 7, 1927.

Recent dates: Sept. 10, 1920; Sept. 4 and 5, 1924; Oct. 1, 1925; Oct. 15,

EASTERN PIGEON HAWK. *Falco colubarius colubarius* LINNAEUS.

An uncommon but regular migrant of which there are numerous records of specimens taken. There are two specimens in the Academy collection (1849 and 3742) from Cook Co., Ill.

Spring: Mar. 11 (very early); Apr. 8 (early); Apr. 26 (average); May 9 (late). Summer: July 10, 1932. Autumn: Sept. 8 (early); Sept. 25 (average); Oct. 25 (late).

EASTERN SPARROW HAWK. *Falco sparverius sparverius* LINNAEUS.

A common summer resident and a fairly common winter resident. There are numerous breeding records from the area.

Spring arrival: Feb. 26 (early); Mar. 12 (average). Breeding: June 12, 1915, Highland Park, Lake Co., Ill., 4 eggs; May 10, 1917, Willow Springs, Cook Co., Ill. Autumn departure: Sept. 30 (average); Nov. 10 (late). Winter: Dec. 3 and 24; Jan. 7; Feb. 12.

Order **GALLIFORMES.** Gallinaceous birds

EASTERN RUFFED GROUSE. *Bonasa umbellus umbellus* (LINNAEUS).

An uncommon local resident. A few are still to be found in Walworth Co., Wis. We have records of a nest in Kankakee Co., Ill., May 2, 1888, and of two in Porter Co., Ind., May 13 and 16, 1920. There are eggs in the Academy collection taken in Lake Co., Ill., May 8, 1893. Three skins (C.A.S. 2516, 5760, and 4011) were taken in Lake Co., Ind., Cook and Kane Cos., Ill.

* **WILLOW PTARMIGAN.** *Lagopus lagopus albus* (GMELIN).

Two birds supposed to have been taken near Racine, Wis., December, 1846 were reported by Hoy, (1852).

GREATER PRAIRIE CHICKEN *Tympanuchus c. americanus* REICHENBACH

An uncommon local resident; breeds in May. These fine game birds are still found in small numbers in the Chicago area, and now that there is a closed season, we hope they will increase. We have records of several nests, as listed below. Mr. H. B. Conover has taken birds in DuPage Co., Ill., November 16, 1912, September 5, 1915, and October 7, 1917, and there are two specimens in the Academy collection taken at Woodstock, McHenry Co., Ill., on November 10, 1930 and November 11, 1931.

Breeding: May 30, 1914, Elk Grove, Cook Co., Ill., 13 eggs; May 22, 1915, Mundelein, Lake Co., Ill., 2 nests, 12 and 14 eggs; May 10, 1925, Waukegan (Beach), Lake Co., Ill., 14 eggs.

* **PRAIRIE SHARP-TAILED GROUSE.** *Pedioecetes p. campestris* RIDGWAY.

Several were secured at Waukegan, Lake Co., Ill., 1863 or 1864, according to Nelson (1876). It was reported seen in Porter Co., Ind., April, 1915, (Brennan, 1918). There is a skin (5704) in the Academy collection from Geneva, Kane Co., Ill., "prior to 1894."

EUROPEAN PARTRIDGE. *Perdix perdix perdix* (LINNAEUS).

Fairly common locally. This alien species shows a definite increase since its introduction into this region about twenty-five years ago.

Breeding: May 29, 1932, southern portion of Walworth Co., Wis., 9 eggs.

EASTERN BOB-WHITE. *Colinus virginianus virginianus* (LINNAEUS).

A locally common resident. The Bob-white still persists in those parts of our area where it has been given protection. It would be well if this species could be put on the protected list in our area as well as in other localities.

Breeding: June 2, 1931, Mount Hope Cemetery, near Chicago, 9 eggs.

RING-NECKED PHEASANT. *Phasianus colchicus torquatus* GMELIN.

A common resident. This introduced species, while varying in numbers from year to year, is increasing in a large part of our area.

Breeding: May 23, 1933, Cook County Forest Preserve at Palos Park, Ill., 14 eggs.

- * **EASTERN TURKEY.** *Meleagris gallopavo silvestris* VIEILLOT.
Extinct in our area. "Formerly plentiful" (Nelson, 1876). One was taken in Cook Co., Ill., March 23, 1878 (Cory, 1909). Last noted in Lake Co., Ind., about 1880; in Newton Co., Ind., 1884; and in La Porte Co., Ind., 1886 (Butler, 1897).

Order **GRUIFORMES.** Cranes, rails, and allies

- * **WHOOPING CRANE.** *Grus canadensis tabida* (PETERS).
Extinct in this region. Nelson recorded this wonderful bird as "once an abundant migrant." One was taken at Chicago in June, 1858 (Baird, 1858).

SANDHILL CRANE. *Grus canadensis tabida* (PETERS).

A rare migrant. It was formerly a summer resident, the eggs having been taken in Walworth Co., Wis., May 30, 1883 (Kumlien and Hollister, 1903); in Starke Co., Ind., eggs were taken May 5, 1890 and young were found June 11, 1891 (Butler, 1897). A specimen was taken by C. S. Raddin at Evanston in the seventies (C.A.S. 6080). A number of competent observers have seen the bird in our region in comparatively recent years. The latest report published (Sanborn, 1922) refers to one seen in the Indiana Dunes, Apr. 16, 1920.

Recent dates: Sept. 11, 1915; Apr. 7 and 22, 1917; Apr. 22, 1920; May 20, 1923; Apr. 3, 1928; Sept. 16 and 17, 1929.

KING RAIL. *Rallus elegans elegans* AUDUBON.

A common summer resident, which starts nesting early in May, when the vegetation is high enough to hide its bulky platforms. Excellent motion films of an adult with eggs and young were made for the Academy's film library (Bailey 1931).

Spring arrival: Apr. 11 (early); Apr. 20 (average). Breeding: May 19, 1914, Highland Park, Lake Co., Ill., 12 eggs; June 16, 1931, McGinnis Slough, Orland, Cook Co., Ill., 14 eggs. Autumn departure: Sept. 18 (average); Oct. 21 (late).

VIRGINIA RAIL. *Rallus limicola limicola* VIEILLOT.

A common summer resident.

Spring arrival: Apr. 7 (early); Apr. 25 (average). Breeding: May 5, 1921, Hyde Lake, Cook Co., Ill., 2 eggs; June 8, 1931, McGinnis Slough, Orland, Cook Co., Ill., 9 eggs. Autumn departure: Sept. 12 (average); Oct. 8 (late).

SORA. *Porzana carolina* (LINNAEUS).

A common summer resident.

Spring arrival: Mar. 25 (very early); Apr. 11 (early); Apr. 25 (average). Breeding: June 10, 1931, Palos Park, Cook Co., Ill., 9 eggs; May 27, 1933, McGinnis Slough, Orland, Cook Co., Ill., 6 eggs. Autumn departure: Sept. 20 (average); Oct. 21 (late); Nov. 4 (very late).

YELLOW RAIL. *Coturnicops noveboracensis* (GMELIN).

A rare summer resident. The Academy has a specimen (4704) taken at Geneva, Kane Co., Ill., Nov. 1, 1891. Racine, Wisconsin and Chicago, Illinois are cited as breeding localities by Bent (1926), but we have no definite records.

Recent dates: Apr. 12 and 15, 1915, Apr. 5, 1920, and Apr. 22, 1926, all in Cook Co., Ill.; Sept. 21, 1933, Waukegan, Lake Co., Ill.; Oct. 1, 1933, Grass Lake, Lake Co., Ill.

BLACK RAIL. *Creciscus jamalcensis stoddardi* COALE.

A rare summer resident. Eggs still in existence (Ford 1926) were taken on the Calumet River Cook Co., Ill., June 19, 1875 (Nelson, 1876). A bird taken at Hyde Lake, Cook Co., Ill., May 30, 1916, is the type of this subspecies which was named in honor of its collector, Mr. H. L. Stoddard (Coale, 1923). There is a specimen (C. A. S. 2542) taken at Chicago, July 4, 1925.

Spring arrival: Apr. 29, 1931, live bird taken in Merchandise Mart Building, Chicago, May 30. July 4, 1925, Chicago (C.A.S. 2542). Autumn: Sept. 1898.

PURPLE GALLINULE. *Ionornis martinica* (LINNAEUS).

A rare summer visitant. There are records of four taken, the latest at Bellwood, Cook Co., Ill., September 22, 1925 (Eifrig, 1927).

FLORIDA GALLINULE. *Gallinula chloropus cachinnans* BANGS.

A common summer resident, usually nests in June. There are numerous nesting records

Spring arrival: Apr. 14 (early); Apr. 27 (average). Breeding: June 6, 1916, Long Lake, Lake Co., Ind., (Eifrig 1918); May 25, 1928, Homewood, Cook Co., Ill., 4 eggs; June 10, 1931, 11 eggs, and June 2, 1932, 16 nests with 4-14 eggs. McGinnis Slough, Orland, Cook Co., Ill. Autumn departure: Sept. 10 (average); Sept. 30 (late).

AMERICAN COOT. *Fulica americana americana* GMELIN.

A common summer resident. It breeds in all favorable localities beginning early in May.

Spring arrival: Feb. 27 (very early); Mar. 10 (early); Mar. 25 (average). Breeding: May 25, 1929, Homewood, Cook Co., Ill., 4 nests, 4 to 9 eggs; June 10, 1931, McGinnis Slough, Orland, Cook Co., Ill., 12 eggs hatching; May 30, 1933, Lake Co., Ill., 10 nests, 1 to 11 eggs. Autumn departure: Oct. 20 (average); Nov. 19 (late). Winter: Dec. 5, 1920; Dec. 19, 1921; Dec. 21, 1926; Jan. 9, 1929; Dec. 26, 1931.

Order **CHARADRIIFORMES.** Shore birds, gulls, auks, and allies

PIPING PLOVER. *Charadrius melodus* ORD.

A local summer resident, found on the beaches of the Waukegan Flats and the Indiana Sand Dunes. There are several published records of nests and the authors have notes of 14 others.

Spring arrival: Apr. 16 (early); May 1 (average). Breeding: June 12, 1920, Beach, (Waukegan) Lake Co., Ill., 4 eggs. Autumn departure: Aug. 30 (average); Sept. 10 (late).

SEMPALMATED PLOVER. *Charadrius semipalmatus* BONAPARTE.

A fairly common migrant. Nelson (1876) regarded it as probably breeding. There are several skins in the Academy collection.

Spring: May 5 (early); May 16 (average); June 7 (late). Autumn: July 18 (early); Aug. 12 (average); Oct. 11 (late); Oct. 28 (very late).

KILLDEER. *Oxyechus vociferus vociferus* (LINNAEUS).

A common summer resident; rare in winter. This is our commonest shore bird in summer, and frequently nests in parks. Ford and others have found it nesting in Grant Park, Chicago.

Spring arrival: Feb. 13, 1932 (early); Mar. 3 (average). Breeding: June 12, 1920, Beach (Waukegan), Lake Co., Ill., 4 eggs; May 29, 1933, Oakwood Cemetery, Chicago, 4 nests, 1 to 4 eggs. Autumn departure: Oct. 30 (average); Nov. 29 (late). Winter: Dec. 16, 1931; Jan. 20, 1932.



WOODCOCK

AMERICAN GOLDEN PLOVER. *Pluvialis dominica dominica* (MUELLER).

Uncommon migrant. Formerly a common migrant. There are several skins in the Academy collection, two of which (2555 and 2556) were taken in Cook Co., Ill., September 19, 1898. Mr. H. B. Conover's shooting records list ten birds in DuPage Co., October 8, 1916, and one September 20, 1925. Reports of several observers indicate an increase in numbers during the past two or three years.

Spring: Apr. 22 (early); May 8 (average); May 30 (late). Autumn: July 22 (early); Sept. 14 (average); Oct. 16 (late); Nov. 5 (very late).

BLACK-BELLIED PLOVER. *Squatarola squatarola* (LINNAEUS).

A fairly common migrant. There are several skins in the Academy collection.

Spring: Apr. 23 (early); May 21 (average); June 2 (late). Summer: June 18, 1922; July 9, 1930 (non-breeding birds). Autumn: Aug. 21 (early); Sept. 10 (average); Nov. 6 (late).

RUDDY TURNSTONE. *Arenaria interpres morinella* (LINNAEUS).

Uncommon migrant. Occurs regularly, especially in late summer, on the shores of Lake Michigan. Taken in Lake Co., Ind., August 8, 1897 (Woodruff, 1907). A skin (83) in the Academy collection, was taken in Cook Co., Ill., September, 1893.

Spring: May 13 (early); June 18 (late). Autumn: July 31 (early); Oct. 16 (late).

AMERICAN WOODCOCK. *Philohela minor* (GMELIN).

A common summer resident. The woodcock is one of the earliest breeding birds of our area, its nesting operations often being interrupted by heavy snows. The eggs are usually laid in April. Ford has found about 50 nests of eggs or downy young in the period from 1909 to 1933. The nesting sites are varied and the eggs or young are always exceedingly difficult to find. Motion films were made of an adult and nest for the Academy's film library (Bailey and Dickinson, 1932).

Spring arrival: Mar. 12 (early); Mar. 28 (average). Breeding: Apr. 10, 1931, Palos Park, Cook Co., Ill., 2 eggs; May 7, 1933, Walworth Co., Wis., 4 eggs hatching. Autumn departure: Oct. 17 (average); Nov. 12 (late).

WILSON'S SNIPE. *Capella delicata* (ORD).

A common migrant, but a rare summer resident. This favorite of the sportsmen is still holding its own in our area. Four breeding records have been published.

Spring arrival: Mar. 10 (early); Apr. 2 (average). Spring departure: May 17 (average); May 27 (late). Breeding: Apr. 24, 1898, Starke Co., Ind., (Deane, 1899a); May 1, 1901, Grass Lake, Lake Co., Ill., 4 eggs; June 9, 1932, female collected at Glen Ellyn, DuPage Co., Ill., had laid. Other summer dates: July 22, 1922; July 31, 1932. Autumn arrival: Sept. 16 (average). Autumn departure: Nov. 1 (average); Nov. 13 (late).

* **LONG-BILLED CURLEW.** *Numenius a. americanus* BECHSTEIN.

A rare visitor. Three were taken at Calumet Lake, Cook Co., Ill., Sept. 22, 1889 (Stoddard, 1921). A few sight records have been published and there is a breeding note from the Calumet marshes (Nelson, 1876) for the spring of 1873. One was observed at Beach (Waukegan), Lake Co., Ill., June 18, 1922.

HUDSONIAN CURLEW. *Phaeopus hudsonicus* (LATHAM).

A rare migrant. A number of sight records have been published. Bent (1929) records it from Calumet Heights, Indiana, August 3, 1902. Doubtless this should be Calumet Heights, Cook County, Illinois. W. I. Lyon has a mounted specimen taken at Waukegan, Lake Co., Ill., September 16, 1923.

Recent sight records: Sept. 7, 1920; Sept. 25 and Oct. 13, 1923; May 18, 1924.

* **ESKIMO CURLEW.** *Phaeopus borealis* (FORSTER).

Probably extinct. There are two skins in the Academy collection; one (C. A. S. 9) taken at Summit, Cook Co., Ill., August, 1872, the other (C. A. S. 3101) procured in the Chicago market in the spring of 1876. Mr. S. S. Gregory has a specimen in his collection taken in Cook Co., Ill., in April, 1880. Mr. Benjamin T. Gault reports that he saw eight of these birds in Lincoln Park, Chicago, on May 22, 1923.

UPLAND PLOVER. *Bartramia longicauda* (BECHSTEIN).

A fairly common summer resident. In the past four or five years nesting pairs have been found near Chicago in localities where they have not bred for a quarter of a century. Bailey secured motion films of a nesting bird at La Grange, Cook Co., Ill., (Bailey, 1930a).

Spring arrival: Apr. 10 (early); Apr. 25 (average). Breeding: May 11, 1917, River Forest, Lake Co., Ill., 4 eggs; June 10, 1922, Homewood, Cook Co., Ill., 4 eggs; May 28, 1931, La Grange, Cook Co., Ill., 4 eggs; May 15, 1932, Maine Township, Cook Co., Ill. Autumn departure: Sept. 5 (average); Sept. 17 (late).

SPOTTED SANDPIPER. *Actitis macularia* (LINNAEUS).

A common summer resident, found regularly nesting in suitable places along the lake shore, and even in parks and in abandoned clay pits near cities.

Spring arrival: Apr. 2 (early); Apr. 28 (average). Breeding: May 26, 1928, Chicago, 4 eggs; June 18, 1921, Beach (Waukegan), Lake Co., Ill., 4 eggs; June 23, 1930, Tremont, Porter Co., Ind., 2 eggs. Autumn departure: Sept. 25 (average); Oct. 30 (late).

EASTERN SOLITARY SANDPIPER. *Tringa solitaria solitaria* WILSON.

A common migrant. Nelson (1876) regarded this species as probably breeding. This conjecture, it seems likely, was due to the fact that individuals sometimes remain into June or reappear in July.

Spring: Apr. 8 (early); Apr. 26 (average); June 8 (late); June 27, 1923 (very late). Autumn: July 9 (early); Aug. 5 (average); Oct. 6 (late).

WESTERN WILLET. *Catoptrophorus s. inornatus* (BREWSTER).

A rare migrant. Nelson (1876) considered it a rare summer resident. Five were taken in Lake Co., Ind., August 14, 1897 (Woodruff, 1898) and it was taken in the same county, August 14, 1898 (Brodkorb 1927a). There are several sight records which, considering the normal distribution of the species, probably are referable to this rather than to the eastern form, *C. s. semipalmatus*.

Recent dates: July 3, 1921; Aug. 2, 1923; Sept. 14 and 18, 1924; Aug. 30, 1926; July 2, 1931; Aug. 23, 1933.

GREATER YELLOW-LEGS. *Totanus melanoleucus* (GMELIN).

A fairly common migrant. Nelson (1876) regarded it as probably breeding, but there are no records. There is a skin in the Academy taken May 17, 1887 in Cook County.

Spring: Apr. 3 (early); Apr. 30 (average); June 4 (late). Autumn: July 19 (early); Aug. 15 (average); Oct. 28 (late).

LESSER YELLOW-LEGS. *Totanus flavipes* (GMELIN).

A common migrant. Nelson (1876) records young barely able to fly, near Chicago, July, 1874. There is also a breeding note from Lake Co., Ind., 1885 (Butler, 1897).

Spring: Mar. 10 (very early); Apr. 4 (early); Apr. 30 (average); May 19 (late). Autumn: July 2 (early); Aug. 1 (average); Oct. 26 (late).

AMERICAN KNOT. *Calidris canutus rufus* (WILSON)

An uncommon migrant. There are records of several taken. Lyon banded two on Waukegan Flats, Lake Co., Ill., September 6, 1924.

Recent records: Oct. 4, 1915; Sept. 2 and 25, 1916; June 2, 1917; Sept. 11, 12, and 13, 1921; May 31, 1924; Aug. 28, 1927; Sept. 12, 1933.

* **PURPLE SANDPIPER** *Arquatella maritima* (BRUENNICH)

Included in our list on the basis of two specimens taken in Cook Co., Ill., November 7, 1871 and June, 1895 (Woodruff, 1896).

PECTORAL SANDPIPER. *Pisobia melanotos* (VIEILLOT).

A common migrant. Probably the most abundant of the migrating shore birds passing through our area. They are seen in marshy areas, in grassy pastures, and are often observed upon golf courses.

Spring: Mar. 12 (very early); Apr. 5 (early); Apr. 12 (average); May 29 (late). Autumn: July 2 (early); July 26 (average); Oct. 12 (late).

WHITE-RUMPED SANDPIPER. *Pisobia fuscicollis* (VIEILLOT).

A rare migrant. It was taken near Waukegan, Lake Co., Ill., June 9, 1876 (Nelson, 1876), and at Chicago, October 20, 1877 (Gault, 1922). One was seen in Lincoln Park, Chicago, August 29, 1920 by Mr. B. T. Gault.

BAIRD'S SANDPIPER. *Pisobia bairdi* (COUES).

An uncommon migrant. There are several records of birds taken. One was secured in Berrien Co., Mich., September 5, 1917 (Woodruff, 1919); one was taken at Waukegan Flats, Lake Co., Ill., September 10, 1922 (C. A. S. 5528), and another (6167) was taken in Kenosha Co., Wis., September 12, 1933.

Recent dates: Aug. 23, 1916, Dune Park, Porter Co., Ind., Sept. 2, 1916, Miller, Lake Co., Ind.; Aug. 19, 1923, Sept. 14, 1930, and August 23, 1933 at Waukegan, Lake Co., Ill.; Oct. 11, 1933, Calumet Lake, Cook Co., Ill.

LEAST SANDPIPER. *Pisobia minutilla* (VIEILLOT).

A common migrant. One of these sandpipers was found building a nest near the Calumet River, June 5, 1875 (Nelson, 1876).

Spring: Apr. 30 (early); May 7 (average); June 7 (late). Autumn: July 2 (early); July 26 (average); Oct. 2 (late).

RED-BACKED SANDPIPER. *Pelidna alpina sakhalina* (VIEILLOT).

A common migrant. This sandpiper is often found along the sandy shore of Lake Michigan. Among the skins in the Academy collection are two from Cook Co., Ill., (72 and 73), taken April 27, 1886 and May 17, 1887.

Spring: Apr. 22 (early); May 15 (average); June 18 (late). Autumn: July 27 (early); Sept. 1 (average); Nov. 6 (late).

EASTERN DOWITCHER *Limnodromus griseus griseus* (GMELIN)

LONG-BILLED DOWITCHER *Limnodromus griseus scolopaceus* (SAY)

A rare migrant. There are few specimens from our area for study, so the status of these shore birds is uncertain. Woodruff (1896) records five specimens and (1898) a flock of ten birds (Whiting, Lake Co., Ind., Aug. 21, 1897) from which an eastern dowitcher was collected. In his book (1907) he referred to *griseus* taken on these dates: Liverpool, Ind., Sept. 2, 1892; South Chicago, May 6, 1893 and Grand Crossing, July 19, 1893, but he did not mention the number of birds secured; he identified two birds, taken at South Chicago, May 6, 1893, as *scolopaceus*. Leopold (1920) took a female at Hyde Lake, Cook Co., Ill., May 14, 1920, ascribing it to *scolopaceus*. Later (1923) he decided this, and two others taken in the same locality on July 22, 1922, were nearer the measurements of *griseus* than *scolopaceus*. Butler (1929) recorded a female long-billed dowitcher taken at Kouts, Porter Co., Ind., April 30, 1890.

STILT SANDPIPER *Micropalama himantopus* (BONAPARTE)

A rare migrant. There are published records of several taken, one (C.A.S. 2549) taken at Libertyville, Lake Co., Ill., Aug. 24, 1895; one shot by Mr. Conover in DuPage Co., Ill., Sept. 3, 1916; another, from Lincoln Park, Chicago, Aug. 31, 1925 (Stevenson, 1929a); and the last, collected by Mr. A. J. Franzen at Calumet Lake, Cook Co., Ill., Aug. 20, 1933.

SEMI-PALMATED SANDPIPER. *Ereunetes pusillus* (LINNAEUS).

A common migrant.

Spring: May 5 (early); May 12 (average); June 9 (late). Autumn: July 16 (early); Aug. 5 (average); Oct. 1 (late).

WESTERN SANDPIPER. *Ereunetes mauri* CABANIS.

A rare migrant. One was taken at Hyde Lake, Cook Co., Ill., May 19, 1928 (Brodkorb, 1928a). This specimen, a male, was identified by Dr. H. C. Oberholser, and is in the collection of Mr. S. S. Gregory Jr. Authorities differ as to the status of this bird in the interior, but the fact that there are few skins taken in our area seems to justify the classification given.

BUFF-BREASTED SANDPIPER. *Tryngites subruficollis* (VIEILLOT).

A rare migrant. There are records of several taken: Waukegan Flats, Lake Co., Ill., October 2, 1921 (Sanborn, 1922); Cook Co., Ill., (C. A. S. 2649) April, 1906. The last specimen of which we have record is one collected by W. A. Weber at Beach (Waukegan), Lake Co., Ill., September 19, 1931.

Sight Records: Aug. 30, 1916, and May 6, 1919, Miller, Lake Co., Ind.

* **MARbled GODWIT.** *Limosa fedoa* (LINNAEUS).

One was taken at Calumet Lake, Cook Co., Ill., May 15, 1889 (Stoddard, 1921). This constitutes the only record for our region.

* **HUDSONIAN GODWIT.** *Limosa haemastica* (LINNAEUS).

Accidental. Specimens were taken in Cook Co., Ill., September 27, 1889 and October 4, 1889 (Stoddard, 1921). One was taken in Lake Co., Ill., June, 1892 (Woodruff, 1907) and another Sept. 5, 1898 at Wolf Lake, Lake Co., Ind., by Charles Brandler. There are also several recent sight records for Chicago.

* **RUFF.** *Philomachus pugnax* (LINNAEUS).

One specimen of this European bird has been taken in Starke Co., Ind., April 12, 1905 (Deane, 1905a).

SANDERLING *Crocethia alba* (PALLAS).

A common migrant.

Spring: Apr. 25 (early); May 15 (average); June 4 (late). Autumn: July 17 (early); Aug. 2 (average); Nov. 6 (late).

* **AMERICAN AVOCET.** *Recurvirostra americana* GMELIN.

Accidental. Two were taken at Chicago, May 5, 1889 (Stoddard, 1921), and one at Calumet Lake, Indiana [sic] no date given (Bent, 1927).

* **BLACK-NECKED STILT.** *Himantopus mexicanus* (MUELLER).

Accidental. It was "an exceedingly rare visitant" according to Nelson (1876). A small flock was seen in Racine Co., Wis., in 1847 (Hoy, 1852). There appear to be no other records for our area.

* **RED PHALAROPE.** *Phalaropus fulicarius* (LINNAEUS).

Accidental. One was taken in Jasper Co., Ind., April 10, 1885 (Butler, 1897). Bent (1927) records it as occurring at Delavan, Walworth Co., Wis., October 11, 1902.

WILSON'S PHALAROPE. *Steganopus tricolor* VIEILLOT.

An uncommon local summer resident. Ford's notes refer to eight breeding records. There are six skins in the Academy collection from our area, including one (4090) taken by Robert Kennicott at West Northfield, Cook Co., Ill., about 1858, and a male taken by Woodruff in South Chicago, Cook Co., Ill., July, 1892.

Spring arrival: Apr. 30 (early); May 15 (average). Breeding: June 2, 1926, Wolf Lake, Cook Co., Ill., (Bodenstein, 1930). Autumn departure: Aug. 10 (average); Aug. 29 (late).

NORTHERN PHALAROPE. *Lobipes lobatus* (LINNAEUS).

A rare migrant. Recorded as taken at Calumet Heights, Cook Co., Ill., 1901 and Calumet Lake, Cook Co., Ill., September 27, 1903 (Woodruff, 1907). A specimen was taken at Waukegan, Lake Co., Ill., September 14, 1930 (Stevenson and Brodkorb, 1933).

POMARINE JAEGER. *Stercorarius pomarinus* (TEMMINCK).

Rare fall migrant. We include this species on the basis of observational records as follows: Nelson (1876) reported that it was seen at Chicago, October 9, 1876, and Sanborn (1922a) reported that it was seen off Lincoln Park, Chicago, October 16, 1921.

PARASITIC JAEGER. *Stercorarius parasiticus* (LINNAEUS).

A rare fall visitant. There were two taken off Chicago, October 29, 1926 (Eifrig, 1927), and there is a skin in the Academy collection (2227), taken in Porter County, Indiana, October 5, 1929. Mr. C. W. G. Eifrig reports a specimen in his collection taken off Chicago, November 5, 1922. Sanborn's notes record one taken November 30, 1918, at Miller, Lake Co., Ind.

* **LONG-TAILED JAEGER.** *Stercorarius longicaudus* (VIEILLOT).

An uncommon fall migrant. There are records of three taken; one was secured September 21, 1915 at Millers, Lake Co., Ind., one in October, 1916 at Lake Como, Walworth Co., Wis., another was observed at Miller, Lake Co., Ind., August 20, 1917, and one was found dead in the same locality, Sept. 11, 1917.

* **GLAUCOUS GULL.** *Larus hyperboreus* GUNNERUS.

Rare winter visitant. There are but two published records. According to Nelson (1876) one was taken near Racine, Wisconsin, but no date is given. Another was secured in Lake Co., Ind., August 8, 1897 (Woodruff, 1898).

* **ICELAND GULL.** *Larus leucopterus* VIEILLOT.

This is included on the basis of the report of Nelson (1876) who says, "Not uncommon on Lake Michigan," but it has never been taken.

* **GREAT BLACK-BACKED GULL.** *Larus marinus* LINNAEUS.

Nelson (1876) refers to it as "not uncommon on Lake Michigan." It has been observed in Porter Co., Ind., September 26, 1895 (Eifrig, 1927), and at Evanston, Cook Co., Ill., February 14, 1927 (Brodkorb, 1927).

* **WYMAN'S GULL.** *Larus occidentalis wymani* DICKEY AND VAN ROSSEM.

One taken off Lincoln Park, Chicago, November 17, 1927, (C. A. S. 1663) (Wright and Komarek, 1928) constitutes our only record.

HERRING GULL. *Larus argentatus smithsonianus* COUES.

A common migrant and resident. It does not breed in our area, but may be seen along Lake Michigan throughout the year.

RING-BILLED GULL. *Larus delawarensis* ORD.

A common migrant, often spending the winter with us. It does not breed in our area, but a few, at least, may be seen in summer on Lake Michigan.

* **FRANKLIN'S GULL.** *Larus pipixcan* WAGLER.

A rare visitor. There are records of two; the latest taken at Chicago, by C. C. Sanborn on October 27, 1922, is now in Field Museum.

Fall: Aug. 30 (early); Oct. 27 (late).

BONAPARTE'S GULL. *Larus philadelphia* (ORD).

A common migrant and fairly common non-breeding resident. These small gulls are usually seen on or near Lake Michigan. During migration they often occur in large flocks, but at other times individuals will be observed associating with herring and ring-billed gulls.

Spring: Mar. 1 (early); Apr. 20 (average); May 30 (late). Summer: June 19, 1923; June 25, 1928; July 10, 1931. Autumn: July 31 (early); Aug. 10 (average); Nov. 19 (late). Winter: Dec. 20, 1923; Jan. 2, 1931; Feb. 1, 1933.

* **ATLANTIC KITTIWAKE.** *Rissa tridactyla tridactyla* (LINNAEUS).

A casual visitor. It is recorded from Racine, Wisconsin, March 17, 1884 (Bent, 1920) and one was taken off Lincoln Park, Chicago, date not given (Woodruff, 1897).

* **SABINE'S GULL.** *Xema sabini* (SABINE).

Rare visitant. We find but two records. One was seen near Chicago April, 1873 (Nelson, 1876) and one was taken at Delavan Lake, Walworth Co., Wis., October 7, 1900 (Hollister, 1901).

* **GULL-BILLED TERN.** *Gelochelidon nilotica aranea* (WILSON).

Nelson (1876) recorded it as a rare summer visitant. No specimens have been taken.

FORSTER'S TERN. *Sterna forsteri* NUTTALL.

A common migrant. Nelson (1876) found it nesting at Grass Lake, Lake Co., Ill., June 14 and 15, 1876. Stoddard (MS.) writes: "In the fall of the year this species is sometimes the most abundant of the terns on the south end of the lake, appearing in small numbers by the first week of August and increasing throughout the remainder of the month, remaining through September and well into October."

Spring: Apr. 28 (early); May 17 (average); June 19 (late). Autumn: Aug. 7 (early); Sept. 1 (average); Oct. 12 (late).

COMMON TERN. *Sterna hirundo hirundo* LINNAEUS.

A common migrant. It is seen on small inland lakes as well as on Lake Michigan and adjacent waters. This species breeds commonly on islands of Lake Michigan, north of our area.

Spring: Apr. 15 (early); May 2 (average); June 19 (late). Autumn: Aug. 1 (early); Sept. 1 (average); Oct. 28 (late).

* **ROSEATE TERN.** *Sterna dougalli dougalli* MONTAGU.

Accidental. The only record for it is one taken at Miller, Lake Co., Ind., August 14, 1916 (Stoddard, 1917).

* **LEAST TERN.** *Sterna antillarum antillarum* (LESSON).

Accidental. One was taken on the Calumet marshes, Cook Co., Ill., June 11, 1876 (Nelson, 1876), and eggs were taken at Wolf Lake, Lake Co., Ind., June 5, 1882 (Butler, 1897).

* **ROYAL TERN.** *Thalasseus maximus maximus* (BODDAERT).

Nelson (1876) refers to the species as an exceedingly rare summer visitant, but no specimens have been taken.

CASPIAN TERN. *Hydroprogne caspia imperator* (COUES).

An uncommon migrant. There are four skins from our area in the Academy collection.

Spring: Apr. 26 (early); May 20 (late). Autumn: Aug. 11 (early); Oct. 5 (late).

BLACK TERN. *Chlidonias nigra surinamensis* (GMELIN).

A common summer resident.

Spring arrival: Apr. 21 (early); May 5 (average). Breeding: May 29, 1933, McGinnis Slough, Orland, Cook Co., Ill., 13 nests, 1 to 3 eggs; July 2, 1915, Butler Lake, Lake Co., Ill., 3 eggs. Autumn departure: Sept. 25 (average); Oct. 18 (late).

* **BRUNNICH'S MURRE.** *Uria lomvia lomvia* (LINNAEUS).

Rare casual. Once recorded from our region: Newton Co., Ind., December 31, 1896 (Butler, 1897).

Order **COLUMBIFORMES.** Pigeon-like birds

ROCK DOVE. *Columba livia livia* GMELIN.

A common permanent resident. Our common domestic dove or "pigeon" has been admitted to the A. O. U. Check List and so finds a place in ours.

EASTERN MOURNING DOVE *Zenaidura m. carolinensis* (LINNAEUS)

A common summer resident, occasionally passing the winter months with us.

Spring arrival: Mar. 10 (early); Mar. 21 (average). Breeding: Mar. 31, 1931, Highland Park, Lake Co., Ill., 1 egg; May 18, 1932, Chicago, 2 eggs; Sept. 24, 1930, Lake Co., Ill., 2 young. Autumn departure: Sept. 30 (average); Nov. 6 (late). Winter: Dec. 21 and 28; Jan. 8 and 9; Feb. 6.

* **PASSENGER PIGEON** *Ectopistes migratorius* (LINNAEUS).

Extinct. Formerly a common summer resident and migrant. The last breeding record from our area, according to published reports is "Spring, 1893." (Deane, 1895). The last bird taken was a young male secured in the Calumet region, Sept. 30, 1901 (Coale, 1925). There are seven skins in the Academy collection, the latest (3099) taken in Rogers Park, Chicago, about 1897; another is an immature bird taken in Cook Co., Ill., June, 1860. There is a specimen in the collection of Mr. S. S. Gregory, Jr., which was collected at Waukegan, Lake Co., Ill., December 10, 1890.

Order **PSITTACIFORMES.** Paroquets

* **LOUISIANA PAROQUET.** *Conuropsis carolinensis ludovicianus* (GMELIN)

Extinct. Nelson (1876) asserts that Kennicott took this species in this vicinity many years ago.

Order **CUCULIFORMES.** Cuckoo-like birds

YELLOW-BILLED CUCKOO. *Coccyzus a. americanus* (LINNAEUS)

A common summer resident. Nests from June to September, the latter month, however, representing unusually late records.

Spring arrival: May 4 (early); May 15 (average). Breeding: June 18, 1931, Palos Park, Cook Co., Ill., 3 eggs; Aug. 14, 1916, Highland Park, Lake Co., Ill., 4 eggs ready to hatch. Autumn departure: Sept. 20 (average); Oct. 14 (late).

BLACK-BILLED CUCKOO. *Coccyzus erythrophthalmus* (WILSON).

A fairly common summer resident; less numerous than the preceding species.

Spring arrival: May 4 (early); May 12 (average). Breeding: June 3, 1911, Highland Park, Lake Co., Ill., 3 eggs and 1 of the yellow-billed cuckoo; June 29, 1929, Homewood, Cook Co., Ill., 3 eggs; Aug. 2, 1916, Highland Park, Lake Co., Ill., 2 eggs. Autumn departure: Sept. 30 (average); Oct. 21 (late).

Order **STRIGIFORMES.** Owls

BARN OWL. *Tyto alba pratincola* (BONAPARTE).

A rare resident. There are three published breeding records. The specimens in the mounted group in the Academy, showing old and immature birds, were obtained at Kouts, Porter Co., Ind., about 1909. Four young about three weeks old were taken from an old water tower west of Fort Sheridan, Lake Co., Ill., early in October, 1927. One was raised by Mr. Bert Leech of Highland Park.

Recent dates: Jan. 12, 1925; Feb. 9, 1925; Mar. 1, 1919; Apr. 30, 1921; May 30, 1921; June 3, 1928; July 30, 1924; Aug. 16, 1917; Sept. 26, 1921; Oct. 16, 1929; Nov. 16, 1930; Dec. 5, 1931.

EASTERN SCREECH OWL. *Otus asio naevius* (GMELIN).

A common resident, often found in cities.

Breeding: Apr. 10, 1930, Palos Park, Cook Co., Ill., 4 eggs; Apr. 3, 1932, Dolton, Cook Co., Ill., 6 eggs; June 1, 1931, Orland, Cook Co., Ill., 4 young ready to fly.

* **ARCTIC HORNED OWL.** *Bubo virginianus subarcticus* HOY.

Nelson (1876) refers to a specimen taken in the last of December, 1874.

GREAT HORNED OWL. *Bubo virginianus virginianus* (GMELIN).

These birds have become rare over a large part of our area due to the misguided activities of gunners. Ford's notes refer to eight nests in Porter Co., Ind., located in the years 1917 to 1921.

Breeding: Mar. 15 and 17, 1914, Porter Co., Ind., 2 nests, 2 and 3 eggs; Feb. 24, 1917, Mineral Springs, Porter Co., Ind., 2 eggs; Feb. 29, 1920, Dune Park, Porter Co., Ind., 3 eggs.

SNOWY OWL. *Nyctea nyctea* (LINNAEUS).

An irregular winter visitant. It is probable that the visits of this arctic nesting species are due to a scarcity of food to the north of us. In some years they are fairly numerous.

November 1 is our earliest autumn date and March 14 our last spring date.

* **AMERICAN HAWK OWL.** *Surnia ulula caparoch* (MUELLER).

A rare visitor. One was taken in Kane Co., Ill., September, 1869 (Nelson, 1876), and one in Chicago by Mr. Arthur Rueckert, December 3, 1922 (Sanborn, 1930). This specimen is in the Field Museum.

* **WESTERN BURROWING OWL** *Speotyto c. hypugaea* (BONAPARTE)

Accidental. One was secured in Porter Co., Ind., April 16, 1924 (Hine, 1924a), and is now in Field Museum.

NORTHERN BARRED OWL. *Strix varia varia* BARTON.

An uncommon resident. These fine birds of prey are rarely seen in our region, although a few have been observed during the past season.

Breeding: Apr. 24, 1917, Des Plaines River woods near Half Day, Lake Co., Ill., 2 nests, 2 and 4 young; Apr. 13, 1919, Bannockburn, Lake Co., Ill., 4 eggs; Apr. 29, 1920, Tremont, Porter Co., Ind., 2 newly hatched young.

* **GREAT GRAY OWL.** *Scotiaptex nebulosa nebulosa* (FORSTER).
Nelson (1876) records this species as a rare winter visitant.

LONG-EARED OWL. *Asio wilsonianus* (LESSON).

A common migrant, but an uncommon resident. Small groups of these birds often winter in thickets. Nest and young found in Porter Co., Ind., May 25, 1914 (Eifrig, 1918).

SHORT-EARED OWL. *Asio flammeus flammeus* (PONTOPPIDAN).

An uncommon summer resident, but a fairly common winter visitant. Breeding: Early May, 1910, Glen Ellyn, DuPage Co., Ill., 5 eggs; May 10, 1925, Beach (Waukegan), Lake Co., Ill., 6 eggs. (Brodkorb, 1926c).

* **RICHARDSON'S OWL.** *Cryptoglaux funerea richardsoni* (BONAPARTE).
This owl has been taken three times in our area: Kenilworth, Cook Co., Ill., Dec. 1902; Cicero, Cook Co., Ill., December 1902 (Deane, 1903 and 1903a); and Chicago, March 15, 1914, (Coale, 1914).

SAW-WHET OWL. *Cryptoglaux acadica acadica* (GMELIN).

A rare summer resident; an uncommon winter visitant. There are three published breeding notes: Juveniles taken, June 14-28, 1889, in Lake Co., Ind. (Butler, 1897). Young recorded in Newton Co., Ind., July, 1907 (Hollister, 1908); young at Chicago and Evanston, Cook Co., Ill., June, 1932 (Ford, 1932).

Recent records: Young recorded at Niles Center, Cook Co., Ill., June 13, 1932, (one shot); June 22, one seen; July 5, one found dead; July 4, adult seen at Highland Park, Lake Co., Ill.

Order **CAPRIMULGIFORMES.** Goatsuckers and allies

EASTERN WHIP-POOR-WILL. *Antrostomus v. vociferus* (WILSON).

A fairly common summer resident. Although not so numerous as formerly, they still occur throughout the area.

Spring arrival: Apr. 18 (early); Apr. 30 (average). Breeding: May 27, 1930, Palos Park, Cook Co., Ill., 2 eggs. Autumn departure: Sept. 10 (average); Sept. 24 (late).

EASTERN NIGHTHAWK. *Chordeiles minor minor* (J. R. FORSTER).

A common summer resident. These are conspicuous migrants, especially in the fall when many hundreds may be seen during the twilight hours. Some probably raise two broods, and perhaps a single egg constitutes the second laying, for on July 30, 1910, Ford found a single incubated egg at Willow Springs, Cook Co., Ill., and again, July 15, 1911, in the same locality, flushed a bird from a single incubated egg. Sennetts' nighthawk, *Chordeiles m. sennetti* Coues, was reported by Nelson (1876) but the specimens were re-identified by Ridgway (1881) as pale examples of the eastern bird.

Spring arrival: May 1 (early); May 10 (average). Breeding: June 10, 1928, Palos Park, Cook Co., Ill., 2 eggs on ground; June 1, 1931, Chicago, 2 eggs on roof. Autumn departure: Sept. 24 (average); Oct. 14 (late).

Order **MICROPODIIFORMES.** Swifts and hummingbirds

CHIMNEY SWIFT. *Chaetura pelagica* (LINNAEUS).

A common summer resident.

Spring arrival: Apr. 18 (early); Apr. 29 (average). Breeding: June 24, 1915, Ravinia, Lake Co., Ill., 4 eggs. Autumn departure: Sept. 10 (average); Sept. 22 (late); Oct. 2 (very late, Chicago); Oct. 14 (very late, Michigan City, Indiana).

RUBY-THROATED HUMMINGBIRD. *Archilochus colubris* (LINNAEUS).
Fairly common summer resident, breeding from June to August.
Spring arrival: Apr. 26 (early); May 10 (average). Breeding: June 24, 1915, Highland Park, Lake Co., Ill., 2 eggs; May 30, 1928, Palos Park, Cook Co., Ill., 2 eggs. Autumn departure: Sept. 18 (average); Oct. 17 (late).

Order **CORACIIFORMES.** Kingfishers

EASTERN BELTED KINGFISHER. *Megasceryle alcyon alcyon* (LINNAEUS).
A common summer resident; not uncommon in winter, where there is open water.

Spring arrival: Mar. 6 (early); Mar. 30 (average). Breeding: May 4, 1911, Palos Park, Cook Co., Ill., 7 eggs. Autumn departure: Oct. 15 (average); Nov. 19 (late). Winter: Jan. 2, 1914; Dec. 18, 1926; Dec. 20, 1931; Jan. 11, 1932; Jan. 7 and 14, 1933.

Order **PICIFORMES.** Woodpeckers

NORTHERN FLICKER. *Colaptes auratus luteus* BANGS.
A permanent resident, more common in summer. This woodpecker apparently has increased in Chicago and its environs during the past twenty-five years.

Spring arrival: Mar. 2 (early); Mar. 31 (average). Breeding: Apr. 25, building; May 19, eggs; June 24, 2 eggs; May 25, 7 eggs. Autumn departure: Oct. 16 (average); Nov. 26 (late). Winter: Dec. 24, 1929; Jan. 6, 1930; Jan. 20 and Feb. 5, 1932; Jan. 3, 1933.

NORTHERN PILEATED WOODPECKER. *Coephalocephalus p. abieticola* BANGS
A rare permanent resident. Two were taken in the winter of 1873 near Chicago (Nelson, 1876). There is a skin (C. A. S. 4014) from Kane Co., Ill., taken "prior to 1894." A specimen was taken in Porter Co., Ind., Dec. 5, 1894 (Brodkorb, 1927a) and one in Lake Co., Ill., Dec. 30, 1893 (Woodruff, 1907). Another, secured in Lincoln Park, Chicago, in October, 1898 (K. & H., 1903), is now in the collection of Mr. S. S. Gregory, Jr. There appears to be only one recent record, a male collected at Antioch, Lake Co., Ill., on October 20, 1933. (James J. Mooney collection).

RED-BELLIED WOODPECKER. *Centurus carolinus* (LINNAEUS)
Uncommon migrant; rare resident. These southern woodpeckers have been recorded during all months of the year, but they are most numerous in April and May. Woodruff (1907) reported it as breeding commonly in Porter Co., Ind., and Cory (1909) recorded a set of three eggs at Joliet, Will Co., Ill., May 26, 1906.

RED-HEADED WOODPECKER. *Melanerpes erythrocephalus* (LINNAEUS).
A common summer resident, often wintering in our area. The red-head was probably more numerous in former years; thousands have been killed by automobiles on our paved highways, and few birds are found in some areas where they were formerly common.

Breeding: June 7, 1914, Lake Co., Ill., 5 eggs; May 21, 1928, Chicago, 5 eggs; June 18, 1930, Tremont, Porter Co., Ind., young out of nest; June 1, 1931, Palos Park, Cook Co., Ill., 6 eggs.

* **LEWIS'S WOODPECKER.** *Asyndesmus lewis* GRAY.

Accidental. Mr. Ashley Hine (1924) saw one on the north side of Chicago on May 26, 1923 and on May 14, 1932 Mr. G. P. Lewis reported another from Argo, Ill.

YELLOW-BELLIED SAPSUCKER. *Sphyrapicus varius varius* (LINNAEUS)

A common migrant and a rare resident. This sapsucker arrives early in the spring and has left our area by the latter part of May. Butler (1897) gives breeding notes from Starke County, Indiana, June 3, 1888, and from Porter County, Indiana, 1895 and 1896. There are skins of juveniles, taken from the nest, in the Academy collection. These were secured by Woodruff about June 30, 1910, at Kouts, Porter County, Indiana.

Spring: Mar. 2 (very early); Mar. 18 (early); Apr. 1 (average); May 22 (late). Summer: June 22, 1932, Half Day, Lake Co., Ill. Autumn: Sept. 9 (early); Sept. 22 (average); Oct. 30 (late). Winter: Dec. 20, 1924; Dec. 19, 1915; Dec. 28, 1927; Dec. 26, 1928; Jan. 19, 1929.

EASTERN HAIRY WOODPECKER. *Dryobates v. villosus* (LINNAEUS)

A common permanent resident, but more numerous in winter than in summer.

We have several breeding records: May 2, 1915, Deerfield, Lake Co., Ill., 4 eggs (Ford); May 22, 1922, Porter Co., Ind., 4 young ready to fly.

NORTHERN DOWNY WOODPECKER *Dryobates p. medianus* (SWAINSON)

A common resident. Like the preceding species it is more numerous in winter than in summer, but it is a fairly common breeding bird.

Breeding: June 13, 1920, Grass Lake, Lake Co., Ill.; May 10, 1929, 5 eggs; Apr. 28, 1930, excavating nest; May 8, 1930, 6 eggs; June 9, 1931, young ready to fly.

ARCTIC THREE-TOED WOODPECKER. *Picoides arcticus* (SWAINSON).

A rare winter visitant. Several specimens have been taken in our area.

Recent dates: Mar. 11, 1917; Nov. 15, 1919; Oct. 3, 7, and 24, Nov. 26, and Dec. 3, 1920; Feb. 17, 1923; Oct. 24, Nov. 15, and Dec. 28, 1924; Jan. 6, 1930.

Order **PASSERIFORMES.** Perching birds

Family **Tyrannidae** Tyrant flycatcher

EASTERN KINGBIRD *Tyrannus tyrannus* (LINNAEUS)

A common summer resident. It is less plentiful than twenty-five years ago, but is still found throughout the area.

Spring arrival: Apr. 16 (very early); Apr. 30 (early); May 8 (average). Breeding: June 10, 1914, Lake Villa, Lake Co., Ill., 3 eggs. May 25, 1932, Orland, Cook Co., Ill., 2 eggs. Autumn departure. Sept. 10 (average); Sept. 19 (late).

* **ARKANSAS KINGBIRD** *Tyrannus verticalis* SAY

Accidental. One was found dead in Highland Park, Lake Co., Ill., June 6, 1924 (Coale 1924) and is now in the mounted bird collection of the Lincoln Ave. Grammar School in that city. This western species has been noted at various points on the eastern sea board and apparently individuals are wide ranging and likely to appear in almost any locality.

NORTHERN CRESTED FLYCATCHER *Myiarchus crinitis boreus* BANGS

A common summer resident.

Spring arrival: Apr. 30 (early); May 8 (average). Breeding: June, 21, 1915, Highland Park, Lake Co., Ill., 3 eggs. June 16, 1931, Palos Park, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 10 (average); Oct. 10 (late).

EASTERN PHOEBE *Sayornis phoebe* (LATHAM)

A common summer resident. Modern concrete construction has done away with the convenient nesting sites offered by highway bridges of the old type. Hence this species is not so frequently seen along the roads as formerly.

Spring arrival: Feb. 26, 1932, Chicago (very early); Mar. 11 (early); Mar. 26 (average). Breeding: May 8, 1926, 6 eggs; May 16, 1930, 5 eggs; June 12, 1931, 4 half-grown young. Autumn departure: Oct. 5 (average); Oct. 25 (late); Nov. 8 (very late).

* **SAY'S PHOEBE** *Sayornis saya saya* (BONAPARTE)

This rare casual from the west has been recorded twice. One was taken at Racine, Wisconsin, no date given (Baird, Brewer and Ridgway 1874), and two were taken in Cook Co., Ill., (no date given), according to Nelson (1876).

YELLOW-BELLIED FLYCATCHER *Empidonax flaviventris* (B. & B.)

A common migrant. Nelson (1876) reports it as probably nesting, July, 1873.

Spring: May 7 (early); May 15 (average); June 9 (late). Autumn: Aug. 1 (very early); Aug. 14 (early); Sept. 8 (average); Sept. 22 (late).

ACADIAN FLYCATCHER *Empidonax virens* (VIEILLLOT)

A common migrant and an uncommon summer resident. Nesting records have been published for Will and Lake Cos., Ill., and from Lake, Porter, and Starke Cos., Ind.

Spring: May 13 (early); May 19 (average). Breeding: June 27, 1906, 2 eggs, Lake Forest, Lake Co., Ill.; June 6 to 24, 1906 and 1907, nests with eggs, Joliet, Will Co., Ill.; July 30, 1915, 2 young, June 28, 1916, 2 eggs, July 6, 1919, 3 eggs, Porter Co., Ind.

ALDER FLYCATCHER *Empidonax traillii traillii* (AUDUBON)

A common summer resident. Ford's notes refer to seventeen nests. Stoddard (MS) estimated that in June, 1924, there were from 25 to 30 pairs of this species per square mile of typical nesting cover at Calumet Lake, Cook Co., Ill.

Spring: May 1 (early); May 15 (average). Breeding: June 22, 1931, 2 nests, 4 eggs each, Skokie Marsh, Cook Co., Ill.; June 18, 1932, Wolf Lake, Cook Co., Ill., 2 nests, 1 egg each; June 5, 1932, Northfield, Cook Co., Ill., building. Autumn: Sept. 10 (average); Sept. 20 (late).

LEAST FLYCATCHER *Empidonax minimus* (BAIRD AND BAIRD)

An uncommon summer resident, formerly more common. Ford has records of six nests, 1890 to 1904, in Cook and Lake Cos., Ill., and there are three sets of eggs in the Academy collection, taken in Cook Co., Ill., 1888 to 1892.

Spring: May 1 (early); May 10 (average). Breeding: June 2, 1905, 4 eggs, Fox Lake, Lake Co., Ill. Autumn: Sept. 9 (average); Oct. 4 (late).

EASTERN WOOD PEWEE *Myiochanes virens* (LINNAEUS)

A common summer resident. We have nesting records from Berrien Co., Mich., Porter and La Porte Cos., Ind., and Cook and Lake Cos., Ill.

Spring arrival: Apr. 27 (very early); May 2 (early); May 11 (average).
Breeding: May 25, 1926, 3 eggs; June 1, 1929, 3 eggs; June 28, 1915, 3 eggs;
June 20, 1931, young. Autumn departure: Sept. 15, (average); Sept. 30 (late);
Oct. 24 (very late).

OLIVE-SIDED FLYCATCHER *Nuttallornis mesoleucus* (LICHTENSTEIN)
An uncommon migrant. It has been taken in Cook Co., Ill., May 23, 1896,
(Brodkorb, 1927a) and in Berrien Co., Mich., May 1918 and May, 1920 (Wood,
1922). There are four skins in the Academy collection. Stoddard (MS 1920)
collected three in the dune region of northern Indiana and one at Hyde Lake,
Cook Co., Ill., Aug. 1916.

Spring: May 8 (early); May 16 (average); June 11 (late). Autumn: Aug.
9 (early); Sept. 6 (average); Sept. 23 (late).

Family **Alaudidae** Larks

NORTHERN HORNED LARK *Otocoris alpestris alpestris* (LINNAEUS)
An uncommon winter visitant. Six were taken in La Porte Co., Ind., Feb.
10, 1887 (Butler, 1897). The Eifrig collection contains a specimen taken at
Addison, DuPage Co., Ill., Dec. 8, 1911.

Autumn: Oct. 29 (earliest arrival). Spring: Apr. 26 (latest).

PRAIRIE HORNED LARK *Otocoris alpestris praticola* HENSHAW
A common permanent resident. Golf courses are favorite nesting sites
for these birds.

Breeding: Feb. 29, 1932, 3 eggs; Mar. 11, 1932, 4 eggs; Apr. 20, 1933, young;
Aug. 20, 1931, 4 eggs.

Family **Hirundinidae** Swallows

* **VIOLET-GREEN SWALLOW** *Tachycineta thalassina lepida* MEARNS
A western species for which we have but one local record, a specimen
taken in the Calumet region [Cook Co., Ill., or Lake Co., Ind.] May 4, 1897
(Woodruff, 1907).

TREE SWALLOW *Iridoprocne bicolor* (VIEILLOT)

A common migrant and summer resident.

Spring arrival: Mar. 23 (very early); Apr. 2 (early); Apr. 18 (average).
Breeding: May 22, 1922, 4 eggs; May 30, 1925, 4 eggs; June 12, 1931, young.
Autumn departure: Oct. 5 (average); Oct. 22 (late); Nov. 1 (very late).

BANK SWALLOW *Riparia riparia riparia* (LINNAEUS)

A common summer resident. A colony has existed for years in the forest
preserves in Palos Park, Cook Co., Ill., and another at Lake Forest, Lake Co., Ill.

Spring arrival: Apr. 19 (early); May 3 (average). Breeding: May 13,
1924, building nest; May 22, 1928, 3 eggs; June 15, 1931, young leaving nest.
Autumn departure: Sept. 10 (average); Sept. 22 (late).

ROUGH-WINGED SWALLOW *Stelgidopteryx r. serripennis* (AUDUBON)

A fairly common summer resident. This species does not nest in colonies.
It is often found in abandoned kingfisher holes, in crannies of cliffs, or along
the abutments of bridges.

Spring arrival: Apr. 14 (early); May 5 (average). Breeding: May 27, 1909, Palos Park, Cook Co., Ill., 4 eggs; May 30, 1911, Waukegan, Lake Co., Ill., 4 eggs; June 7, 1907, Joliet, Will Co., Ill., 5 eggs; May 30, 1933, Palos Park, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 16 (late).

BARN SWALLOW *Hirundo erythrogaster* BODDAERT

A common summer resident. A colony of 25 nesting pairs was reported at Waukegan, Lake Co., Ill., June 12, 1915 (Goelitz, 1915).

Spring arrival: Apr. 1 (very early); Apr. 12 (early); Apr. 24 (average). Breeding: June 12, 1915, Waukegan, Lake Co., Ill.; May 18, 1925, 4 eggs; June 13, 1921, 3 young; May 20, 1931, 3 eggs. Autumn departure: Sept. 15 (average); Oct. 4 (late); Oct. 10 (very late).

NORTHERN CLIFF SWALLOW *Petrochelidon a. albifrons* (RAFINESQUE)

An uncommon summer resident, formerly common. Ford's notes refer to a small colony just off North Clark Street, near Peterson Avenue, Chicago, June 20, 1891. There was a breeding colony west of Highland Park, Lake Co., Ill., until 1915 (Goelitz, 1915), and there is now a small colony in Blue Island, Cook Co., Ill.

Spring arrival: Apr. 2 (very early); Apr. 15 (early); May 1 (average). Breeding: May 29, 1929, Blue Island, Cook Co., Ill., 20 nests with eggs. Autumn departure: Sept. 12 (average); Sept. 30 (late).

PURPLE MARTIN *Progne subis subis* (LINNAEUS)

A common summer resident. Fall flocking near Chicago is described by White (1933).

Spring arrival: Mar. 23 (very early); Apr. 1 (early); Apr. 15 (average). Breeding: July 15, 1915, Lake Villa, Lake Co., Ill., young ready to fly; May 25, 1930, Palos Park, Cook Co., Ill., 4 eggs; June 1, 1932, Chicago, 5 eggs. Autumn departure: Sept. 10 (average); Sept. 23 (late).

Family **Corvidae** Jays, magpies, and crows

* **CANADA JAY** *Perisoreus canadensis canadensis* (LINNAEUS)

A northern species of which the only record is that of Nelson (1876) who report its capture near Racine, Wis., winter, 1859.

NORTHERN BLUE JAY *Cyanocitta cristata cristata* (LINNAEUS)

A common permanent resident, more numerous in summer.

Breeding: May 6, 1929, Chicago, 5 eggs; June 20, 1930, Chicago, 6 eggs; Apr. 28, 1933, Chicago, 4 eggs.

* **LONG-CRESTED JAY** *Cyanocitta stelleri diademata* (BONAPARTE)

A straggler, possibly an escaped cage bird (Woodruff, 1912) was taken in Lincoln Park, Chicago, June 12, 1911 (C. A. S. 414).

* **AMERICAN MAGPIE** *Pica pica hudsonia* (SABINE)

Accidental. There appear to be only three records, the latest of which is Nov. 10, 1918, when two birds were seen in a ravine at Lake Forest, Lake Co., Ill. One was injured and was captured by Mr. J. Cropley (Coale 1919).

* **NORTHERN RAVEN** *Corvus corax principalis* RIDGWAY

A rare visitor. A specimen was collected at Waukegan, Lake Co., Ill., on Oct. 15, 1875 by Mr. Douglas, which is now in the S. S. Gregory Jr. collection. Woodruff (1907) mentioned two specimens, but gave no dates and Coale (1912)



HOWARD T. MIDDLETON

BLUE JAY

reported seeing one in Highland Park, Lake Co., Ill., in the spring of 1908. Another was reported from Waukegan, May 12, 1926 (Grasett, 1926).

EASTERN CROW *Corvus brachyrhynchos brachyrhynchos* BREHM

A common resident. This species has managed to hold its own in spite of efforts of hunters to reduce the numbers.

Breeding: May 7, 1921, Highland Park, Lake Co., Ill., 5 eggs; Apr. 1, 1929, Palos Park, Cook Co., Ill., 5 eggs; May 22, 1931, Orland, Cook Co., Ill., young ready to fly.

* CLARK'S NUTCRACKER *Nuctifraga columbiana* (WILSON)

There is but one record of this western species for our area, Cook Co., Ill., Oct. 9, 1894 (Coale, 1911)

Family ^b **Paridae** Titmice, verdins, and bush-tits

BLACK-CAPPED CHICKADEE *Penthestes a. atricapillus* (LINNAEUS)

A fairly common permanent resident, most common in winter.

Breeding: May 15, 1914, Highland Park, Lake Co., Ill., 2 eggs; Apr. 30, 1929, Palos Park, Cook Co., Ill., 7 eggs; May 8, 1932, Cook Co., Ill., 7 eggs (Ford).

* CAROLINA CHICKADEE *Penthestes c. carolinensis* (AUDUBON)

There is one record for this southern form from our area, Lake Forest, Lake Co., Ill., Dec. 25, 1890 (Woodruff, 1907). Butler (1897), apparently referring to the same specimen, gives the date, Dec. 12, 1890.

* HUDSONIAN CHICKADEE *Penthestes h. hudsonicus* (FORESTER)

A rare visitor. One specimen was taken on Waukegan Flats, Lake Co., Ill., Nov. 5, 1906 (Ferry, 1907), and two females in the same locality, Nov. 8, 1906 (Woodruff, 1907a).

TUFTED TITMOUSE *Baeolophus bicolor* (LINNAEUS)

A fairly common resident. Probably more common in the southern part of our region, but it seems to be more plentiful now in Cook Co., Ill., than formerly.

Breeding: May 6, 1933, Forest Preserves near Palos Park, Cook Co., Ill., 7 eggs; May, 1933, Batavia, Kane Co., Ill., 6 eggs (Pearsall).

Family **Sittidae** Nuthatches

WHITE-BREASTED NUTHATCH *Sitta carolinensis carolinensis* LATHAM
A fairly common resident, more numerous in winter.

Breeding: Apr. 22, 1916, near Half Day, Lake Co., Ill., 7 eggs; June 1, 1928, Tremont, Porter Co., Ind., young leaving nest; May 5, 1932, Palos Park, Cook Co., Ill., 8 eggs.

RED-BREASTED NUTHATCH *Sitta canadensis* LINNAEUS

A common migrant and a rare summer resident. Nelson (1876) reports full grown young near Chicago the first of July [no year given] and unfledged young the last of April, 1876, at Evanston, Cook Co., Ill.

Spring: Mar. 24, (early); Apr. 15 (average); June 7 (late). Autumn: Aug. 19 (early); Sept. 7 (average); Nov. 3 (late). Winter: Dec. 18, 26, and 27; Jan. 1, 13, and 31; Feb. 15.

Family **Certhiidae** Creepers

BROWN CREEPER *Certhia familiaris americana* BONAPARTE

A common migrant, occasionally remaining through winter.

Spring: Mar. 2 (early); Apr. 1 (average); May 18 (late). Autumn: Sept. 10 (early); Sept. 20 (average); Nov. 1 (late). Winter: Dec. 18, 24, and 26; Jan. 19; Feb. 2. Possibly breeds here, but there are no records.

Family **Troglodytidae** Wrens

EASTERN HOUSE WREN *Troglodytes aedon aedon* VIEILLOT

A common summer resident. Two forms occur in our area, but the breeding status of these has not been satisfactorily determined. A nest and eggs taken at Joliet, Will Co., Ill., June 14, 1906, is referred to the eastern bird (Cory, 1909). It is probable that there is intergradation; of twelve house wrens in the Academy collection, taken in our area, four seem to be nearer this form than to specimens of *parkmani* from Colorado.

Spring arrival: Apr. 9 (very early); Apr. 14 (early); Apr. 25 (average). Breeding: May 16, 1928, 6 eggs; June 5, 1929, 7 eggs; July 4, 1930, young leaving nest; July 16, 6 eggs, second nesting. Autumn departure: Sept. 16, (average); Oct. 12 (late); Oct. 30 (very late).

WESTERN HOUSE WREN *Troglodytes aedon parkmani* AUDUBON

Status uncertain. Of twelve house wrens in the Academy collection, taken in our area, eight, including three juveniles, taken in Aug., represent this form.

EASTERN WINTER WREN *Nannus hiemalis hiemalis* (VIEILLOT)

A fairly common migrant and rare winter visitant.

Spring: Mar. 16, (early); Apr. 2 (average); May 13 (late). Autumn: Sept. 10 (early); Sept. 22 (average); Nov. 2 (late). Winter: Dec. 24, 1920; Jan. 2, 1922; Dec. 24, 1927.

BEWICK'S WREN *Thryomanes bewicki bewicki* (AUDUBON)

A rare summer resident. It nested in Chicago in June, 1876 (Nelson, 1876), and was observed building its nest in Porter Co., Ind., Aug. 4, 1924 (Lewis, 1924). A nest with 7 eggs was reported from the dune region, Porter Co., Ind., May 29, 1927 (Cramp, 1927).

Recent dates: Apr. 2, 22, and 30, 1921; May 6, June 3, 1923; May 6, 1924; Apr. 26, 1925; Apr. 30, 1927; May 26, 1928; July 23, 1930.

CAROLINA WREN *Thryothorus ludovicianus ludovicianus* (LATHAM)

An uncommon winter visitant and a rare summer resident. During the past ten years there have been records for each month of the year, although seldom more than a half dozen records for any one year.

Breeding: Woodruff (1907) mentions several broods raised near Lake Forest, Lake Co., Ill., but gives no dates; Apr. 18, 1909, Palos Park, Cook Co., Ill., 2 eggs.

LONG-BILLED MARSH WREN *Telmatodytes palustris palustris* (WILSON)

According to Cory (1909) both this and the following form breed in our area. He refers nine specimens, taken in our area, to *palustris*. Five of these, at least, were taken in the breeding season. But the A.O.U. Check List for 1931 restricts *palustris* to the Atlantic coast region.

PRAIRIE MARSH WREN *Telmatodytes palustris dissaeptus* (BANGS)

A common summer resident. Five specimens taken in the breeding season in our area are referred to this form (Cory, 1909). Woodruff (1907) accepted Ridgway's finding and considered *illacus* (now *dissaeptus*) the bird of our region.

Spring: April 11 (early); April 30 (average). Breeding: June 1, 1928, McGinnis Slough, Orland, Cook Co., Ill., 5 eggs; June 15, 1916, Highland Park, Lake Co., Ill., 7 eggs. Autumn departure: Oct. 1 (average); Oct. 21, (late).

SHORT-BILLED MARSH WREN *Cistothorus stellaris* (HAUMANN)

A fairly common summer resident. The nest is difficult to find and actual nesting records are scarce.

Spring arrival: Apr. 14 (very early); Apr. 22 (early); May 10 (average). Breeding: June 1, 1929, Skokie Marsh, Cook Co., Ill., 4 eggs; June 4, 1930, Cook Co., Ill., 7 eggs. Autumn departure: Oct. 2 (average); Oct. 17 (late).

Family **Mimidae** Mockingbirds and thrashers

EASTERN MOCKING BIRD *Mimus polyglottos polyglottos* (LINNAEUS)

A rare visitant. Nelson (1876) reports Dr. Hoy as having recorded six nests near Racine, Wis. A specimen was taken at Hyde Lake, Cook Co., Ill., May, 14, 1927, and two in the same locality, May 12, 1928 (Brodkorb, 1930). Two were captured and banded at Zion, Lake Co., Ill., in Oct. 1933 by Miss Louise Miller.

Recent records: Jan. and Feb. 1922; Apr. 1, 20, 26, 28, and 30; May 6, 7, 10, 12, 13, 15, 18, 21, and 28; June 5 and 7; Nov. 6, 1921. Breeding: May 28, 1907, Joliet, Will Co., Ill., 3 eggs.

CATBIRD *Dumetella carolinensis* (LINNAEUS)

A common summer resident.

Spring arrival: Apr. 18 (early); May 3 (average). Breeding: May 19, 1929, 4 eggs; June 12, 1930, 3 eggs; July 6, 1931, 4 eggs; July 13, 1915, 3 eggs. Autumn departure: Sept. 20 (average); Oct. 14 (late); Oct. 26 (very late).

BROWN THRASHER *Toxostoma rufum* (LINNAEUS)

A common summer resident; rare or casual in winter.

Spring arrival: Apr. 2 (early); Apr. 20 (average). Breeding: May 8, 1928, 1 egg; May 30, 1928, 4 eggs; June 13, 1928, 4 eggs; Aug. 9, 1914, 3 eggs. Autumn departure: Sept. 22 (average); Oct. 24 (late). Winter: Dec. 17, 1922, Maywood, Ill.; Dec. 22, 1922, River Forest, Ill.; Feb. 12, 13, and 15, 1932, Chicago, Ill.

Family **Turdidae** Thrushes, bluebirds, stonechats, and solitaires

EASTERN ROBIN *Turdus migratorius migratorius* LINNAEUS

Abundant summer resident, uncommon but regular in winter.

Breeding: Apr. 18, eggs; May 7, eggs; June 12, eggs; July 7, eggs; Aug. 9, eggs.

WOOD THRUSH *Hylocichla mustelina* (GMELIN)

A common summer resident. Ford's notes refer to a nest with eggs at Elk Grove, Cook Co., Ill., June 8, 1931.

Spring arrival: Apr. 3 (very early); Apr. 10 (early); Apr. 30 (average). Breeding: June 10, 1915, 4 young; Aug. 4, 1923, young ready to fly; June 1, 1931, 4 eggs. Autumn departure: Sept. 10 (average); Oct. 3 (late).

* **ALASKA HERMIT THRUSH** *Hylocichla guttata guttata* (PALLAS)

A rare straggler. One was taken at Waukegan Flats, Lake Co., Ill., Nov. 5, 1916 (Coale, 1917).

* **SIERRA HERMIT THRUSH** *Hylocichla guttata sequoiensis* (BELDING)

Six specimens, taken in Cook and Lake Counties, Ill., 1921 to 1928, were identified by H. C. Oberholser as this form (Brodkorb, 1930). Other authorities have considered these birds to be *faxoni*, the common form of our region.

EASTERN HERMIT THRUSH *Hylocichla g. faxoni* BANGS AND PENARD

A common migrant, occasionally winters.

Spring: Mar. 16, (early); Mar. 29 (average); May 17 (late). Autumn: Aug. 30 (very early); Sept. 15 (early); Sept. 28 (average); Nov. 4 (late); Nov. 14 (very late). Winter: Feb. 20, 1921, Porter Co., Ind.; Feb. 17, 1921, Chicago; Dec. 6, 1928, Chicago.

OLIVE BACKED THRUSH *Hylocichla ustulata swainsoni* (TSCHUDI)

A common migrant.

Spring: Mar. 31, 1920 (very early); Apr. 23 (early); May 2 (average); June 11, 1932 (late). Autumn: July 31 (very early); Aug. 16 (early); Sept. 4 (average); Oct. 24 (late).

GRAY-CHEEKED THRUSH *Hylocichla minima alliciae* (BAIRD)

A common migrant.

Spring: Apr. 26 (early); May 8 (average); June 4 (late). Autumn: Aug. 22 (early); Sept. 6 (average); Oct. 14 (late).

BICKNELL'S THRUSH *Hylocichla minima minima* (LAFRESNAYE)

An uncommon migrant. There are five skins in the Academy collection taken in Cook Co., Ill., one on Aug. 27, 1898, one on Sept. 2, 1898, and three on Sept. 20, 1909. Taken in Lake Co., Ill., Sept. 6, 1909 (Coale, 1916), Sept. 22, 1921 (Sanborn, 1921a). The Elfrig collection contains a specimen taken in Lake Co., Ind., Oct. 8, 1932.

VEERY *Hylocichla fuscescens fuscescens* (STEPHENS)

A common migrant, but an uncommon summer resident.

There is a breeding record for *fuscescens* from Berrien Co., Mich., May 25, 1919 (Wood 1922). Also, Ford's notes refer to five nests found in Cook and Lake Counties, Ill., the latest being June 9, 1912. There are two eggs in the Academy collection taken May 29, 1892 at Niles, Cook Co., Ill. Whether this or the next form is the breeding bird of our area has not been determined.

Spring: Apr. 5 (very early); Apr. 14 (early); Apr. 30 (average); June 6 (late). Summer: July 4, 1932. Autumn: Aug. 5 (very early); Aug. 26 (early); Sept. 6 (average); Oct. 13 (late). Breeding: (See above).

WILLOW THRUSH *Hylocichla fuscescens salicicola* RIDGWAY

If this is the breeding form of our region it is of uncommon occurrence in summer, but it is a common migrant. Possibly it may be more plentiful than the veery. There are nine skins in the Academy collection, taken in our area; none of these are breeding specimens. (See remarks under preceding form).

EASTERN BLUEBIRD *Sialia sialis sialis* (LINNAEUS)

A common summer resident; uncommon and irregular in winter.

Spring arrival: Feb. 18 (early); Mar. 5 (average). Breeding: Apr. 20, 1928, 4 eggs; May 12, 1930, 5 eggs; June 16, 1930, 4 eggs; June 25, 1931, full grown young. Autumn departure: Oct. 16, (average); Nov. 18 (late). Winter: Dec. 1, 1930; Dec. 26, 1931; Jan. 8, 1932.

* **TOWNSEND'S SOLITAIRE** *Myadestes townsendi* (AUDUBON)

One specimen of this straggler from the west was taken in Lake Co., Ill., Dec. 16, 1875 (Nelson, 1876) and is now in the collection of S. S. Gregory, Jr.

Family **Sylviidae** Warblers, gnatcatchers, and kinglets

BLUE-GRAY GNATCATCHER *Polioptila caerulea caerulea* (LINNAEUS)

An uncommon summer resident. Reported breeding in Starke, Porter, and Lake Cos., Ind., and Cook Co., Ill., no dates given (Butler, 1897). Ford's notes refer to nests in Cook Co., Ill., June 18, 1899, and in Porter Co., Ind., June 26, 1918. There is a breeding note from Waukegan Flats, Lake Co., Ill., July 24, 1921 (Sanborn, 1922), and another from Deerfield, Lake Co., Ill., May 23, 1933.

Spring arrival: Apr. 13 (early); Apr. 28 (average). Breeding: (see above). Autumn departure: Sept. 8 (average); Sept. 21 (late).

EASTERN GOLDEN-CROWNED KINGLET *Regulus s. satrapa* LICHTENSTEIN

A common migrant; a few remain through the winter.

Spring: Mar. 12 (early); Mar. 30 (average); May 13 (late). Autumn: Sept. 19 (early); Oct. 1 (average); Nov. 8 (late). Winter: Dec. 6, 24, 26, and 30; Jan. 3, 14, and 30; Feb. 2 and 16.

EASTERN RUBY-CROWNED KINGLET *Corthylio c. calendula* (LINNAEUS)

A common migrant, rare in winter.

Spring: Mar. 21 (early); Apr. 7 (average); June 8 (late). Autumn: Sept. 9 (early); Sept. 26 (average); Oct. 21 (late); Nov. 21 (very late). Winter: Feb. 20, 1916; Jan. 23, 1920.

Family **Motacillidae** Pipits

AMERICAN PIPIT *Anthus spinoletta rubescens* (TUNSTALL)

Uncommon and irregular migrant. There are two skins in the Academy collection (1319 and 1320) taken in Cook Co., Ill., May 23, 1910. Stoddard (MS. 1920) took a specimen at Riverside, Cook Co., Ill., Apr. 15, 1917. J. S. White has skins in his collection taken at Waukegan, Lake Co., Ill., Sept. 17 and 22, 1927, and May 5, 1929.

Spring: Apr. 3 (early); May 18 (late). Autumn: Sept. 19 (early); Oct. 18 (late).



ISAAC E. HESS

MIGRANT SHRIKE

Family **Bombycillidae** Waxwings

BOHEMIAN WAXWING *Bombycilla garrula pallidiceps* REICHENOW

An irregular winter visitant. Lyon banded 131 at Waukegan, Lake Co., Ill., Mar. to Apr. 1932. Our earliest autumn date is Nov. 12, 1927 and our latest spring date, Apr. 18, 1932.

CEDAR WAXWING *Bombycilla cedrorum* VIEILLOT

A common summer resident, occasionally occurs in winter.

Spring arrival: Mar. 10 (early); Apr. 2 (average). Breeding: June 18, 1928, 4 eggs; July 4, 1930, young; Aug. 12, 1931, 2 eggs; Aug. 29, 1926, 4 eggs. Autumn departure: Sept. 30 (average); Nov. 12 (late). Winter: Jan. 3, 1921; Feb. 20, 1923; Dec. 29, 1931; Feb. 4, 1932.

Family **Laniidae** Shrikes

NORTHERN SHRIKE *Lanius borealis borealis* VIEILLOT

An uncommon winter visitant. There is a skin in the Academy collection taken in Lake Co., Ill., Nov. 7, 1929. Stoddard (MS. 1920) took a specimen in Porter Co., Ind., Dec. 23, 1916, and W. I. Lyon has trapped ten birds at his banding station in Waukegan, in the past fourteen years; four were taken in Mar., one in Apr., and five in Oct.

Recent records: Jan. 4 and 8, and Mar. 15, 1921; Jan. 4 and 9, and Apr. 6, 1922; Jan. 11, 1923; Jan. 12 and Feb. 5, 1924; Dec. 23, 1927; Feb. 1 and Dec. 15, 1929; Mar. 15, 1930.

MIGRANT SHRIKE *Lanius ludovicianus migrans* PALMER

A fairly common summer resident; nests chiefly in April and May. It is much less abundant than twenty-five years ago. This may be due to the destruction of osage orange hedges which, in our area, were chiefly used as the nesting site of this species. A late nesting date and an unusual nest site is recorded by Ford, who found large nestlings at Chicago, July 7, 1889, in a nest in a silver poplar.

Spring arrival: Mar. 2 (early); Mar. 18 (average). Breeding: Apr. 29, 1927, 3 eggs; May 10, 1928, 4 eggs; June 10, 1930, half grown young. Autumn departure: Sept. 18 (average); Oct. 12 (late).

Family **Sturnidae** Starlings

STARLING *Sturnus vulgaris vulgaris* LINNAEUS

A common permanent resident which first appeared in our region about ten years ago. An enormous number gather in the forest preserves near the Academy's Trailside Museum at Thatcher Road and Chicago Ave., in September and early October.

Breeding: Apr. 10, 1933, Chicago, 5 eggs; May 20, 1932, 6 eggs; June 30, 1933, young ready to fly.

Family **Vireonidae** Vireos

WHITE-EYED VIREO *Vireo griseus griseus* (BODDAERT)

Rare migrant. Cory (1909) refers to an egg taken at Waukegan, Lake Co., Ill., May 13, 1875; Woodruff (1907) records a bird taken in DuPage Co., Ill., May 23, 1898; and Lewis (1923) saw a bird in Cook Co., Ill., June 3, 1923.

Spring: May 12 (early); May 24 (late). Autumn: one record, Sept. 29, 1933.

* **BELL'S VIREO** *Vireo belli belli* AUDUBON

A rare summer resident. Obtained near Chicago, June 23, 1875 (Nelson, 1876). A breeding bird and nests were taken by H. S. Swarth near Joliet, Will Co., Ill., in June, 1906. (Collection of S. S. Gregory, Jr.).

YELLOW-THROATED VIREO *Vireo flavifrons* VIEILLLOT

A rare summer resident, but a fairly common migrant. There is an egg in the Academy collection, no date given, labelled Lake Forest, Lake Co., Ill. It is recorded as nesting in Lake Co., Ill., June 8, 1885 (Woodruff, 1907). Ford reports a nest found by F. S. Dayton with young near the Cook-Lake County line in Ill., June 26, 1892. There are two skins in the Academy collection taken at Lake Forest, Lake Co., Ill., May 12, 1906.

Spring arrival: May 2 (early); May 12 (average). Breeding: June 1, 1931 Palos Park, Cook Co., Ill., 3 eggs. Autumn departure: Sept. 16 (average); Oct. 1 (late).

BLUE HEADED VIREO *Vireo solitarius solitarius* (WILSON)

A common migrant.

Spring: Apr. 30 (early); May 12 (average); June 4 (late). Autumn: Aug. 11 (early); Sept. 18 (average); Oct. 14 (late); Nov. 5 (very late).

RED-EYED VIREO *Vireo olivaceus* (LINNAEUS)

A common summer resident.

Spring arrival: Apr. 28 (early); May 10 (average). Breeding: June 4, 1929, 4 eggs; June 17, 1914, 3 young. Autumn departure: Sept. 20 (average); Oct. 12 (late).



WM. I. LYON

BLACK AND WHITE WARBLER

PHILADELPHIA VIREO *Vireo philadelphicus* (CASSIN)

An uncommon migrant. There are four skins in the Academy collection: (1033, 1034, 5227, 6147), the latest was taken at Lemont, Cook Co., Ill., Sept. 15, 1933. Stoddard (MS. 1920) took this species at South Chicago and Calumet Lake, Cook Co., Ill., May 15, 1912 and May 26.

Spring: May 12 (early); June 4 (late). Autumn: Aug. 18 (early); Sept. 26 (late).

EASTERN WARBLING VIREO *Vireo gilvus gilvus* (VIEILLOT)

A common summer resident.

Spring arrival: May 1 (early); May 9 (average). Breeding: Ford found a nest in Lincoln Park, Chicago, June 18, 1893. Other records are: July 2, 1915, Lake Co., Ill., one young ready to fly; June 9, 1930, Chicago, young in nest; June 7, 1933, Palos Park, Cook Co., Ill., 3 eggs. Autumn departure: Sept. 10 (average); Sept. 18 (late).

Family **Compsothlypidae** Wood warblers

BLACK AND WHITE WARBLER *Mniotilta varia* (LINNAEUS)

A common migrant and a rare summer resident.

Spring: Apr. 14 (early); Apr. 28 (average); June 5 (late). Breeding: Porter Co., Ind., June 19, 1921 (Sanborn, 1921). Autumn: Aug. 19 (early); Aug. 31 (average); Oct. 20 (late).

PROTHONOTARY WARBLER *Protonotaria citrea* (BODDAERT)

A common summer resident; most abundant in the southeastern part of our area (Ford, 1927 and Butler, 1929).

Spring arrival: Apr. 28 (early); May 6 (average). Breeding: July 2, 1911, Riverside, Cook Co., Ill., 5 eggs; June 26, 1933, Pistakee Lake, Lake Co., Ill., young in nest. Autumn departure: Sept. 20 (average); Oct. 17 (late).

* WORM-EATING WARBLER *Helmitheros vermivorus* (GMELIN)

Very rare summer visitant. There have been a number of recent sight records (all for May), but no specimen has been taken. Nelson observed one at Waukegan, Lake Co., Ill., May 21, 1876 (Nelson, 1876); and two others have been seen in Chicago, May 11, 1908 (Cory, 1909), and in 1910 (Pepoon, 1911).

GOLDEN-WINGED WARBLER *Vermivora chrysoptera* (LINNAEUS)

A fairly common migrant. Nelson (1876) lists it as "breeding rarely", and Butler (1897) says, "Breeding, the spring of 1884", Starke Co., Ind. Kumlien and Hollister (1903) give no date, but refer to its nesting at Racine, Wis. Of six specimens in the Academy collection two were taken at Libertyville, Lake Co., Ill., May 17, 1909. Brewster's warbler, a hybrid of this and the next form, is recorded as having been seen in Cook Co., Ill., May 19, 1929 (Grasett, 1929). Another hybrid, Lawrence's warbler *vermivora (chrysoptera x pinus)* is recorded May 15, 1931.

Spring: Apr. 28 (early); May 12 (average); May 23 (late). Autumn: Aug. 21 (early); Sept. 20 (average); Oct. 7 (late). It may nest within our limits at the present time.

BLUE-WINGED WARBLER *Vermivora pinus* (LINNAEUS)

A rare summer resident and an uncommon migrant. Ford's notes record two nests containing eggs, May 29, 1914 and June 4, 1921 found at Ft. Sheridan, Lake Co., Ill. Stoddard records taking a specimen at Highland Park, Lake Co., Ill., May 14, 1916; J. S. White has specimens taken in Lake Co., Ill., June 18, 1921 and May 20, 1926.

Spring: May 1 (early). Breeding: See above. Autumn: Sept. 15 (late).

TENNESSEE WARBLER *Vermivora peregrina* (WILSON)

A common migrant.

Spring: Apr. 26 (early); May 10 (average); June 9 (late). Autumn: July 29 (very early); Aug. 26 (average); Oct. 13 (late).

ORANGE-CROWNED WARBLER *Vermivora celata celata* (SAY)

An uncommon migrant. Hunt (1921) records a specimen taken in Porter Co., Ind., May 8, 1921. Of six local skins in the Academy collection two were taken at Highland Park, Lake Co., Ill., May 20, 1909.

Spring: Apr. 23 (early); May 6 (average); June 2 (late). Autumn: July 28 (very early); Aug. 20 (early); Sept. 3 (average); Oct. 28 (late).

NASHVILLE WARBLER *Vermivora ruficapilla ruficapilla* (WILSON)

A common migrant. Nelson (1876) calls this species a rare summer resident. Ridgway (1889) says, "breeds in the northern counties of the state [Ill.]". Kumlien and Hollister (1903) refer to it as nesting in Walworth Co., Wis., but give no date.

Spring: Apr. 22 (early); May 6 (average); June 2 (late). Autumn: Aug. 18 (early); Sept. 5 (average); Oct. 19 (late).

NORTHERN PARULA WARBLER *Compsothlypis a. pusilla* (WILSON)

An uncommon migrant. Although Woodruff (1907) refers to this species as a common migrant we are able to find but few references to definite records. Butler (1897) notes that it was taken at English Lake, Starke Co., Ind., June 3, 1888 and seen in Lake Co., Ind., May 24 and May 28, 1894. He also reports that it was observed at Chicago, May 9, 1886 and May 15, 1895.

Spring: Apr. 30 (early); May 7 (average); June 17 (late). Autumn: Aug. 25 (early); Oct. 1 (late). May breed within our limits.

EASTERN YELLOW WARBLER *Dendroica aestiva aestiva* (GMELIN)

A common summer resident.

Spring arrival: Apr. 25 (early); May 3 (average). Breeding: May 26, 1928 nest completed; June 8, 1930, 3 eggs; June 4, 1932, 5 eggs. Autumn departure: Sept. 3, (average); Sept. 26 (late).

MAGNOLIA WARBLER *Dendroica magnolia* (WILSON)

An abundant migrant.

Spring: Apr. 25 (early); May 6 (average); June 8 (late). Autumn: Aug. 12 (early); Aug. 25 (average); Oct. 9 (late).

CAPE MAY WARBLER *Dendroica tigrina* (GMELIN)

A fairly common migrant.

Spring: Apr. 26 (early); May 9 (average); June 3 (late). Autumn: Aug. 20 (early); Sept. 8 (average); Oct. 5 (late).

BLACK-THROATED BLUE WARBLER *Dendroica c. caerulescens* (GMELIN)

A common migrant.

Spring: Apr. 21 (early); May 7 (average); June 3 (late). Autumn: Aug. 23 (early); Sept. 4 (average); Oct. 25 (late).

MYRTLE WARBLER *Dendroica coronata* (LINNAEUS)

An abundant migrant, occasionally winters.

Spring: Mar. 20 (very early); Apr. 1 (early); Apr. 12 (average); May 30 (late). Autumn: Aug. 30 (early); Sept. 10 (average); Nov. 23 (late). Winter: Dec. 29, Glen Ellyn, DuPage Co., Ill.; Jan. 21, 1920, Porter Co., Ind.; Jan. 21, 1923, Beach (Waukegan), Lake Co., Ill.

BLACK-THROATED GREEN WARBLER *Dendroica v. virens* (GMELIN)

A common migrant.

Spring: Apr. 24 (early); May 4 (average); June 8 (late). Autumn: Aug. 15 (early); Sept. 6 (average); Oct. 21 (late).

CERULEAN WARBLER *Dendroica cerulea* (WILSON)

An uncommon summer resident. There are six references regarding the breeding of this species in our area. A nest with three eggs was reported at Palos Park, Cook Co., Ill., May 29, 1932 by Miss Belle Wilson. There is a specimen in the Academy collection taken at Lake Forest, Cook Co., Ill., May 12, 1906.

Spring arrival: Apr. 29 (early); May 9 (average). Autumn departure: Sept. 5 (late).

BLACKBURNIAN WARBLER *Dendroica fusca* (MULLER)

A common migrant.

Spring: Apr. 21 (early); May 5 (average); June 11 (late). Autumn: Aug. 12 (early); Sept. 1 (average); Sept. 29 (late).

SYCAMORE WARBLER *Dendroica dominica albilora* RIDGWAY

A rare visitor. Racine, Wis., June 20, 1848. (Kumlien and Hollister, 1903) and Lake Co., Ill., spring 1876 (Nelson, 1876) are early records of specimens secured. More recently Wood (1922) reports a bird seen in Berrien Co., Mich., Apr. 28, 1918.

CHESTNUT-SIDED WARBLER *Dendroica pensylvanica* (LINNAEUS)

A common migrant and a rare summer resident. Kennicott (1854) and Nelson (1876) list this as a breeding species. Butler (1897) says it is a summer resident in La Porte Co., Ind.

Spring: May 6 (early); May 15 (average); May 27 (late). Breeding: T. H. Douglas said to have taken nest and two eggs at Waukegan, Lake Co., Ill., May 13, 1874. This seems too early for eggs. Autumn: Aug. 27 (early); Sept. 15 (average); Sept. 29 (late).

BAY-BREASTED WARBLER *Dendroica castanea* (WILSON)

A common migrant.

Spring: Apr. 25 (early); May 8 (average); June 5 (late). Autumn: Aug. 13 (early); Sept. 3 (average); Oct. 13 (late).

BLACK POLL WARBLER *Dendroica striata* (FORSTER)

A common migrant.

Spring: Apr. 28 (early); May 14 (average); June 8 (late). Autumn: Aug. 23 (early); Sept. 4 (average); Oct. 3 (late).

NORTHERN PINE WARBLER *Dendroica pinus pinus* (WILSON)

An uncommon migrant. Nelson (1876) refers to young found in the "Pinery", Lake Co., Ind., July, 1874. Butler (1906) records it as a summer resident near Michigan City, Ind., June 19 to June 23, 1904. Of five local skins in the Academy collection the latest is labelled N. E. Ill. May 20, 1921. Stoddard (MS. 1920) collected a specimen in Porter Co., Ind., May 11, 1919. The J. S. White collection contains 3 specimens taken at Waukegan, Lake Co., Ill., Oct. 12, 1927.

Spring: Apr. 17 (early); May 4 (average); June 3 (late). Autumn: Sept. 5 (early); Oct. 12 (late). May possibly breed within our limits at the present time.

KIRTLAND'S WARBLER *Dendroica kirtlandi* (BAIRD)

Extremely rare migrant. This rare warbler whose breeding range so far as known is confined to certain counties in the southern Peninsula of Michigan has been taken twice in our area; DuPage Co., Ill., May 7, 1894 (Chapman, 1898), and Cook Co., Ill., May 21, 1899 (Blackwelder, 1899). In addition it was observed May 25, 1918 at Tremont, Porter Co., Ind. by C. W. G. Elfrig, and again in the same locality May 9, 1924.

NORTHERN PRAIRIE WARBLER *Dendroica discolor discolor* (VIEILLOT)

An uncommon summer resident. There are published breeding notes from Cook and Will Cos. Ill., Porter Co., Ind., and Berrien Co., Mich.

Earliest spring date: May 6. Breeding: June 12, 1920, 4 eggs, June 15, 1920, 1 egg; July 18, 1921, 4 eggs; all in Porter Co., Ind. Latest Autumn date: Sept. 8.

WESTERN PALM WARBLER *Dendroica palmarum palmarum* (GMELIN)

A common migrant.

Spring: Apr. 15, (early); Apr. 25 (average); May 31 (late). Autumn: Aug. 20 (early); Sept. 7 (average); Oct. 29 (late).

OVEN-BIRD *Seturus aurocapillus* (LINNAEUS)

A common migrant and a fairly common summer resident.

Spring arrival: Apr. 21 (early); May 4 (average). Breeding: May 29, 1930, Palos Park, Cook Co., Ill., 4 eggs; June 4, 1931, DuPage Co., Ill., 4 eggs. Autumn departure: Oct. 2 (average); Oct. 19 (late).

NORTHERN WATER-THRUSH *Seturus n. noveboracensis* (GMELIN)

An uncommon migrant. This and the following form are not distinguishable in the field but most sight records refer to this race. Of local skins in the Academy collection, nine are of the next form and two are *noveboracensis*, (3588, 3695). The S. S. Gregory collection contains typical specimens of *S. n. noveboracensis* taken at Highland Park, Lake Co., Ill., on the following dates; Apr. 22, 1906; May 14, 1916; May 20, 1917; May 15, 1920; May 17, 1925.

GRINNELL'S WATER-THRUSH *Selurus noveboracensis notabilis* RIDGWAY

A common migrant. Of eleven water-thrushes in the Academy collection, nine are of this form.

Spring: Apr. 7 (early); Apr. 20 (average); June 8 (late). Autumn: Aug. 9 (early); Aug. 20 (average); Oct. 21 (late).

LOUISIANA WATER-THRUSH *Seiurus motacilla* (VIEILLLOT)

A fairly common migrant and a rare summer resident. We find but one breeding record; Gault collected a female with nest and eggs in Lake Co., Ill., June 11, 1889.

Spring arrival: May 5 (early); May 10 (average). Autumn: Sept. 3 (average); Sept. 16 (late).

CONNECTICUT WARBLER *Oporornis agilis* (WILSON)

A fairly common migrant.

Spring: May 3 (early); May 15 (average); June 7 (late); June 28 (very late). Autumn: Aug. 14 (early); Sept. 6 (average); Sept. 30 (late).

KENTUCKY WARBLER *Oporornis formosus* (WILSON)

A rare summer resident. Our only records of specimens collected are as follows: Cook Co., Ill., May 23, 1887 (Hancock, 1888); May 1892 (Woodruff, 1907) and four from Joliet, Will Co., Ill., May 13 to 29, 1907 (Cory, 1909).

MOURNING WARBLER *Oporornis philadelphia* (WILSON)

An uncommon migrant. Three specimens are in the Academy collection from Waukegan Flats, Lake Co., Ill., May 24, 1907.

Spring: May 11 (early); May 16 (average); June 8 (late). Autumn: Aug. 17 (early); Sept. 10 (average); Sept. 29 (late).

MACGILLIVRAY'S WARBLER *Oporornis tolmiei* (TOWNSEND)

Mr. H. K. Coale collected a specimen at Wolf Lake, Lake Co., Ind., on June 1, 1876. This skin is now in the British Museum (Sharpe, 1885).

NORTHERN YELLOW-THROAT *Geothlypis t. brachydactyla* (SWAINSON)

A common migrant and a fairly common summer resident. Butler (1897) recorded the western yellow-throat from Liverpool, Lake Co., Ind.

Spring arrival: Apr. 20 (early); May 4 (average). Breeding: June 10, 1928, McGinnis Slough, Orland, Cook Co., Ill., 3 eggs; June 20, 1930, Tremont, Porter Co., Ind., newly hatched young. Autumn departure: Sept. 15 (average); Oct. 3 (late).

YELLOW-BREASTED CHAT *Icteria virens virens* (LINNAEUS)

A fairly common local summer resident. Nests in May and June. It is less common in Cook Co., Ill., than twenty-five years ago. Ford's last breeding note refers to a nest with eggs at LaGrange, Cook Co., Ill., June 25, 1921.

Spring arrival: May 6 (early); May 16 (average).

HOODED WARBLER *Wilsonia citrina* (BODDAERT)

A rare summer resident. It was taken in Cook Co., Ill., May 11, 1881, Apr. 28, 1884 and May 3, 1895. (Woodruff, 1907), and also in Berrien Co., Mich., Aug. 31, 1917 and adults and young were observed Sept. 4, 1917. (Wood 1921).

CANADA WARBLER *Wilsonia canadensis* (LINNAEUS)

A common migrant.

Spring: Apr. 30 (early); May 9 (average); June 2 (late); June 26 (very late). Autumn: Aug. 3 (early); Sept. 6 (average); Sept. 22 (late).

AMERICAN REDSTART *Setophaga ruticilla* (LINNAEUS)

An abundant migrant and a common summer resident.

Spring arrival: Apr. 9 (very early); May 1 (early); May 7 (average). Breeding: June 4, 1921, Highland Park, Lake Co., Ill., 4 eggs; May 30, 1930, Palos Park, Cook Co., Ill., 3 eggs. Autumn departure: Sept. 25 (average); Oct. 17 (late).

Family **Ploceidae** Weaver finches

ENGLISH SPARROW *Passer domesticus domesticus* (LINNAEUS)

A common permanent resident. In the city streets of Chicago it is not quite so common as formerly. Nests with fresh eggs may be found from early March until the last of August.

Family **Icteridae** Meadowlarks, blackbirds, and troupials

BOBOLINK *Dolichonyx oryzivorus* (LINNAEUS)

A common summer resident.

Spring arrival: Apr. 25 (early); May 5 (average). Breeding: June 2, 1914, Highland Park, Lake Co., Ill., 6 eggs; May 26, 1923, Orland, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 10 (average); Sept. 30 (late); Oct. 9 (very late).

EASTERN MEADOWLARK *Sturnella magna magna* (LINNAEUS)

A permanent resident, less common in winter.

Spring arrival: Feb. 28 (early); Mar. 11 (average). Breeding: Apr. 29, 1921, 5 eggs; May 11, 1915, 5 eggs; June 1, 1930, 6 eggs; June 20, 1933, young. Autumn departure: Oct. 20 (average); Nov. 15 (late). Winter: Nov. 22; Dec. 12, 20, 25, and 30; Jan. 2, 4, and 27; Feb. 13 and 18.

WESTERN MEADOWLARK *Sturnella neglecta* AUDUBON

Fairly common summer resident in the western portion of the Chicago region.

YELLOW-HEADED BLACKBIRD *Xanthocephalus xanthocephalus* (BON.)

A fairly common local summer resident, formerly common.

Spring arrival: Apr. 20 (early); May 3 (average). Breeding: July 2, 1915, Butler's Lake, Lake Co., Ill., 4 eggs; May 29, 1919, Homewood, Cook Co., Ill., 3 nests, 4 eggs each; May 21, 1932, McGinnis Slough, Orland, Cook Co., Ill., 5 eggs. Autumn departure: Sept. 15 (average); Sept. 23 (late).

EASTERN RED-WING *Agelaius phoeniceus phoeniceus* (LINNAEUS)

A common summer resident.

Spring arrival: Feb. 19 (very early); Feb. 28 (early); Mar. 10 (average). Breeding: May 12, 1923, 3 eggs; May 29, 1928, 5 eggs; May 25, 1931, many nests, eggs and young; June 10, 1931, full grown young. Autumn departure: Oct. 30 (average); Nov. 25 (late). Winter: Dec. 5 and 26, 1927; Dec. 26, 1932. (Note: Winter sight records may refer to *A. p. arctolegus*).

GIANT RED-WING *Agelaius phoeniceus arctolegus* OBERHOLSER

Winter visitant. Status not well determined. Eleven taken in Lake and Cook Counties, Ill., 1925-1928, were identified by H. C. Oberholser as this form. (Brodkorb, 1930).

ORCHARD ORIOLE *Icterus spurius* (LINNAEUS)

A rare summer resident. References to its nesting in our area are few. Woodruff (1907) records it near Evanston, Cook Co., Ill., in June 1880. Eifrig (1919) says he found it nesting at Cary, McHenry Co., Ill., and Ford's notes refer to a nest with four eggs taken in Lincoln Park, Chicago, June 16, 1892, and to a nest with young in Edgewater (Chicago), June 1906.

Spring arrival: Apr. 1 (extremely early); Apr. 28 (early); May 15 (average). Breeding: June 5, 1905, Fox Lake, Lake Co., Ill., 4 eggs and 1 Cow-bird's egg. June 20, 1914 and June 19, 1915, nesting at Wilmette, Cook Co., Ill. Autumn departure: Aug. 6.

BALTIMORE ORIOLE *Icterus galbula* (LINNAEUS)

A common summer resident.

Spring arrival: Apr. 19 (early); May 3 (average). Breeding: June 2, 1929, 5 eggs; June 25, 1930, young in nest; May 28, 1931, building nest. Autumn departure: Sept. 1 (average); Oct. 2 (late).

RUSTY BLACKBIRD *Euphagus carolinus* (MUELLER)

A common migrant.

Spring: Feb. 12 (very early); Mar. 3 (early); Mar. 15 (average); May 16, (late). Autumn: Sept. 5 (early); Oct. 1 (average); Nov. 21 (late). It has been recorded once in winter, Jan. 22, 1906 (Ferry 1907).

BREWER'S BLACKBIRD *Euphagus cyanocephalus* (WAGLER)

A rare summer resident. This western species was first recorded by Nelson (1876). A nest with four eggs was found by A. J. Franzen in Walworth Co., Wis., June 3, 1928 and a nest with four eggs was found by Ford at Northfield, Cook Co., Ill., June 7, 1930 (Ford, 1930). Lyon (1930) gives the recent history of the bird as a breeding species in Lake Co., Ill., where three nests of young were found: June 17, 26, and 28, 1930.

BRONZED GRACKLE *Quiscalus quiscula aeneus* RIDGWAY

A common summer resident, and an uncommon winter resident.

Spring arrival: Feb. 22 (early); Mar. 10 (average). Breeding: Apr. 14, 1922, 5 eggs; May 21, 1929, 5 eggs; Apr. 15, 1931, 6 eggs; June 1, 1932, young leaving nest. Autumn departure: Oct. 30 (average); Nov. 18 (late). Winter: Dec. 6, 21, 26 and 30; Jan. 4; Feb. 1.

EASTERN COWBIRD *Molothrus ater ater* (BODDAERT)

A common summer resident and an uncommon winter resident.

Spring arrival: Feb. 19 (very early); Mar. 9 (early); Mar. 25 (average). Breeding: Apr. 29, 3 eggs in song sparrow's nest; May 14, 1914, 8 eggs in towhee's nest, Lake Co., Ill., (Goelitz, 1915); June 5, 1 egg in field sparrow's nest. Autumn departure: Oct. 1 (average); Nov. 11 (late). Winter: Dec. 26 and 28; Jan. 15; Feb. 7.

Family **Thraupidae** Tanagers

SCARLET TANAGER *Piranga erythromelas* (VIEILLLOT)

Fairly common summer resident.

Spring arrival: Apr. 1 (very early); Apr. 23 (early); May 6 (average). Breeding: June 6, 1929, Palos Park, Cook Co., Ill., 3 eggs; July 17, 1914, Highland Park, Lake Co., Ill., 3 eggs. Autumn departure: Sept. 22 (average); Oct. 2 (late).

* **SUMMER TANAGER** *Piranga rubra rubra* (LINNAEUS)

A rare summer visitant. Kennicott (1854) says, "known to nest in Cook Co., Ill." There are several sight records and a specimen was taken at Highland Park, Lake Co., Ill., on May 19, 1917 by Lyman Barr (Coale, 1918).

Family **Fringillidae** Grosbeaks, finches, sparrows, and buntings

EASTERN CARDINAL *Richmondia cardinalis cardinalis* (LINNAEUS)

A common permanent resident. A rare visitant 25 years ago but it has become more common in recent years. Ford's notes refer to a nest containing two eggs taken in what is now known as uptown Chicago, June 7, 1891. In 1923 W. I. Lyon at Waukegan banded a single bird. In 1933 he banded 13, taking them every month except June and December.

Breeding: May 28, 1931, LaGrange, Cook Co., Ill., 4 eggs; June 6, 1931, Palos Park, Cook Co., Ill., 3 eggs; Aug. 1, 1931, young on wing.

ROSE-BREASTED GROSBEAK *Hedymeles ludovicianus* (LINNAEUS)

A common migrant and a fairly common summer resident.

Spring arrival: Apr. 23 (early); May 6 (average). Breeding: May 18, 1914, Highland Park, Lake Co., Ill., 3 eggs; June 1, 1931, LaGrange, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 20 (average); Oct. 9 (late); Nov. 12 (extremely late), specimen collected at Beach, Waukegan, Lake Co., Ill.

EASTERN BLUE GROSBEAK *Guiraca caerulea caerulea* (LINNAEUS)

A southern species which seems to have but very slight claim to a place in our list; Kumlien and Hollister (1903) say it was taken by Dr. Hoy, supposedly at Racine, Wis. A young male in changing plumage was seen near Oak Park, Cook Co., Ill., May 1931 (Cook, 1933). There is an egg of the species in the Academy collection from Northwestern University labeled "Evanston, Ill".

INDIGO BUNTING *Passerina cyanea* (LINNAEUS)

A common summer resident.

Spring arrival: Apr. 30 (early); May 8 (average). Breeding: June 9, 1915, 3 eggs, Highland Park, Lake Co., Ill.; June 18, 1930, Palos Park, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 10 (average); Oct. 6 (late).

DICKCISSEL *Spiza americana* (GMELIN)

Fairly common summer resident; in some years abundant.

Spring arrival: May 3 (early); May 15 (average). Breeding: June 9, 1931, Palos Park, Cook Co., Ill., 4 eggs. Autumn departure: Aug. 25 (average); Sept. 11 (late).

EASTERN EVENING GROSBEAK *Hesperiphona v. vespertina* (COOPER)

Irregular winter visitant.

Oct. 20 is our earliest autumn date and May 4, the latest spring date.

EASTERN PURPLE FINCH *Carpodacus p. purpureus* (GMELIN)

A common migrant and an irregular winter visitant. Nelson (1876) says a few breed, and Cory (1899) refers to an egg taken at Waukegan, Lake Co., Ill., May 13, 1875.

Spring: Mar. 2 (early); Apr. 10 (average); May 26 (late). Autumn: Aug. 25 (early); Sept. 16 (average); Nov. 23 (late). Winter: Jan. 1, 6, 10, and 28; Feb. 5 and 28; Dec. 26.

CANADIAN PINE GROSBEAK *Pinicola enucleator leucura* (MUELLER)

An uncommon winter visitant. There is a skin (4076) in the Academy collection taken at Evanston, Cook Co., Ill., Jan., 1871. Others were taken in Cook Co., Ill., Feb. 15, 1889 (Bryan, 1899); on Waukegan Flats, Lake Co., Ill., Nov. 5 and 17, 1906 (Ferry, 1907) in Lake Co., Ind., Nov. 30, 1918 (Eifrig, 1919).

Recent dates: Dec. 8, 1910; Nov. 30, 1918; Jan. 7, 1914 and Jan. 17, 1923; Feb. 14, 1924; Jan. 16, 1927; Jan. 20, 1930.

* HOARY REDPOLL *Acanthias hornemanni exilipes* (COUES)

Accidental. A male was secured at Mineral Springs, Porter Co., Ind., Dec. 23, 1916 (Stoddard, 1917a). Specimens are also said to have been taken by Nelson near Chicago (Cory, 1909).

COMMON REDPOLL *Acanthis linaria linaria* (LINNAEUS)

A common winter visitant.

Autumn arrival: Oct. 13 (early). Spring departure: May 6 (late).

* HOLBOELL'S REDPOLL *Acanthis linaria holboellii* (BREHM)

There is a confusion of the records of this form, and although Coale (1883) recorded a female collected by George F. Clingman, Nov. 2, 1878, in Cook Co., Ill., it is probable that this bird should be ascribed to *rostrata* as noted below.

* GREATER REDPOLL *Acanthis linaria rostrata* (COUES)

A rare winter visitant. Cooke (1888) and Ridgway (1889) list a specimen taken by H. K. Coale near Chicago, Nov. 2, 1878, and Butler (1897) records specimens taken by Coale in Cook Co., Ill., Nov. 21, 1878 and Starke Co., Ind., Jan. 1, 1884. Butler, no doubt, made an error in giving the date as Nov. 21. The Catalogue of the Birds of the British Museum lists a specimen as follows: Adult male, Chicago, Ill., Nov. 2, 1873. This date is also probably in error, and is intended to refer to Coale's (or Clingman's) specimen taken Nov. 2, 1878. As Clingman and Coale were frequently together in the field the evidence seems fairly clear that the bird (or birds, if indeed there were more than one) taken in Chicago in November 1878 (or 1873?) is the same which also is ascribed to *holboellii*. There are two other records from our region (Woodruff, 1907) lists one in the Academy collection taken in the '70's by C. V. Holden (this specimen cannot be found), and C. C. Sanborn collected one at Beach (Waukegan), Lake Co., Ill., Dec. 7, 1919 (Brodkorb, 1930).

NORTHERN PINE SISKIN *Spinus pinus pinus* (WILSON)

A fairly common winter visitant appearing irregularly.

Autumn arrival: Sept. 8 (early); Oct. 16 (average). Winter: Dec. 19; Jan. 21. Spring departure: Apr. 4 (early); May 15 (average); June 3 (late).

EASTERN GOLDFINCH *Spinus tristis tristis* (LINNAEUS)

A common permanent resident; most plentiful in summer.

Breeding: Aug. 21, 1915, 1 egg; July 20, 1929, 4 nests, 1 to 6 eggs; Aug. 3, 1931, 6 eggs; Sept. 1, 1931, young just hatched.

RED CROSSBILL *Loxia curvirostra pusilla* (GLOGER)

A fairly common winter visitant but occurs irregularly. There are a number of published records of specimens taken in our area; the latest, Cook Co., Ill., Feb. 1926 (Grasett, 1926). There are 13 local skins in the Academy collection.

Not known to breed here, but has occurred on the following dates: Jan. 6; Feb. 19; Mar. 1; Apr. 8; May 25; June 1; July 19; Aug. 21; Sept. 1; Oct. 20; Nov. 12; Dec. 28.

BENDIRE'S CROSSBILL *Loxia curvirostra bendirei* RINGWAY

A rare winter visitant. Sanborn (1922) records several large flocks of crossbills at Beach (near Waukegan), Lake Co., Ill., between Oct. 29, 1916 and January 11, 1917 under the Newfoundland Crossbill (*L. c. perna*). Five specimens were taken for the Henry K. Coale collection, and there are others taken at the same time which are in the Field Museum.

WHITE-WINGED CROSSBILL *Loxia leucoptera* (GMELIN)

An uncommon winter visitor. Specimens were secured on Waukegan Flats, Nov. 5, 13, 1906 (Ferry, 1907). There are five specimens in the Academy collection, the latest (5226) a female collected Dec. 30, 1919 by C. J. Hunt at Millers, Lake Co., Ind. Stoddard (MS.) took two birds at Dune Park, Porter Co., Ind., Nov. 9, 1919.

Recent dates: Oct. 22 and Nov. 5, 1916; Dec. 30, 1919; Dec. 26, 1932; Jan. 12, 1934.

* **ARCTIC TOWHEE** *Pipilo maculatus arcticus* (SWAINSON)

This western form has been taken once in our area. It was secured in Cook Co., Ill., Oct. 24, 1898 (Woodruff, 1907).

RED-EYED TOWHEE *Pipilo e. erythrophthalmus* (LINNAEUS)

Common summer resident.

Spring arrival: Mar. 12 (early); Mar. 26 (average). Breeding: May 7, 1928, 3 eggs; May 20, 1928, 4 eggs; Aug. 20, 1930, 3 eggs. Autumn departure: Oct. 10 (average); Nov. 16 (late). Winter: Jan. 5, 1933.

EASTERN SAVANNAH SPARROW *Passerculus s. savanna* (WILSON)

NEVADA SAVANNAH SPARROW *Passerculus s. nevadensis* (GRINNELL)

Common migrants and summer residents. The savannah sparrows of our area present a perplexing problem. At least two races occur and possibly three. The specimens of the Academy collection are now being studied by Dr. James L. Peters and associates at the Museum of Comparative Zoology, and he writes that of all the birds he has handled from Illinois, very few could be called typical *savanna*. There are specimens of *nevadensis* from our area in the Academy collection according to Mr. Peters, and in addition there are several very dark birds which resemble *labradorius*. Sight records may refer to any of the above mentioned.

Spring arrival: Mar. 15 (early); Apr. 4 (average). Breeding: May 9, 1928, Orland, Cook Co., Ill., 4 eggs; June 20, 1912, Wolf Lake, Cook Co., Ill., 5 eggs. Autumn departure: Oct. 20 (average); Nov. 9 (late); Dec. 21 (very late, specimen collected).

EASTERN GRASSHOPPER SPARROW *Ammodramus s. australis* MAYNARD

A fairly common summer resident.

Spring arrival: Apr. 9 (early); Apr. 26 (average). Breeding: June 14, 1914, Niles Twsp., Cook Co., Ill., 5 eggs; June 3, 1926, Palos Park, Cook Co., Ill., 5 eggs; Calumet Lake, Cook Co., Ill., June 23, 1914, eggs. Autumn departure: Sept. 10 (average); Oct. 1 (late); Nov. 12 (very late. Specimen collected Nov. 12, 1927 at Beach, (Waukegan) Lake Co., Ill.

LECONTE'S SPARROW *Passerherbulus caudacutus* (LATHAM)

A fairly common migrant and a rare summer resident. Likely to be overlooked because of its furtive habits. Ford's notes record two nests with eggs found but a few yards apart, at Chicago Ridge, Cook Co., Ill., May 28, 1910 and June 12, 1910. The circumstances suggest that they represented nesting attempts by the same pair of birds. Stoddard (MS.) saw a bird of this species

in this same locality, May 16, 1919, and took one at Calumet Lake, Cook Co., Ill., Apr. 20, 1913. Four specimens were secured by the Academy in the fall of 1933; one at Antioch, Lake Co., Ill., Sep. 27; one at Lemont, Cook Co., Ill., Oct. 5, and two near Lake Marie, Lake Co., Ill., Oct. 12.

Spring: Mar. 28 (early); Apr. 10 (average). Breeding (see above). Autumn: Sept. 9 (early); Oct. 12 (late).

WESTERN HENSLOW'S SPARROW *Passerherbulus h. henslowi* (AUDUBON)
A common summer resident.

Spring arrival: Mar. 16 (very early); Mar. 26 (early); Apr. 24 (average). Breeding: June 22, 1919, Porter Co., Ind., eggs; June 18, 1932, Wolf Lake, Cook Co., Ill., 3 eggs and 2 cowbird's eggs; June 2, 1929, Delavan, Walworth Co., Wis., eggs. Autumn departure: Sept. 30 (average); Oct. 16 (late); Nov. 12 (very late).

NELSON'S SPARROW *Ammospiza caudacuta nelsoni* (ALLEN)

An uncommon migrant and a rare summer resident. Nelson (1876) records that he saw several of these birds at Lake Calumet, Cook Co., Ill., June 12, 1875, "where they were undoubtedly breeding". Woodruff (1907) records many specimens from the area, and a nest and eggs from near Calumet Lake. A male was taken at Wolf Lake May 27, 1922 (Eifrig, 1923). White (1930) reports a bird of this species at Waukegan, Lake Co., Ill., May 25, 1930. The Academy collection contains specimens taken at Lemont, Cook Co., Ill., Sept. 27, 1933 and Oct. 5, 1933.

Spring: May 3, (early). Autumn: Oct. 13 (late).

EASTERN VESPER SPARROW *Pooecetes gramineus gramineus* (GMELIN)
Common summer resident.

Spring arrival: Mar. 16 (early); Apr. 5 (average). Breeding: May 9, 1921, 3 eggs; June 7, 1928, 4 young; Aug. 4, 1928, 4 eggs. Autumn departure: Sept. 28 (average); Oct. 30 (late); Nov. 21, 1920 (very late).

EASTERN LARK SPARROW *Chondestes grammacus grammacus* (SAY)

A rare summer resident. Formerly a common breeding species. Ford's notes refer to five nests in Cook Co., Ill., 1888 to 1896. There is a set of eggs in the Academy collection taken in Lake Co., Ill., July 4, 1891. There are nine local skins in the Academy collection. Eifrig's collection contains a specimen from DuPage Co., Ill., May 4, 1912; Stoddard (MS.) took a specimen at Worth, Cook Co., Ill., Apr. 28, 1913; and another was collected at Beach, Waukegan, Lake Co., Ill., on July 9, 1927 (Brodkorb, 1930).

Spring: Apr. 17 (early). Breeding: May 21, 1906, Joliet, Will Co., Ill., 4 eggs. Autumn: Sept. 17 (late).

BACHMAN'S SPARROW *Aimophila aestivalis bachmani* (AUDUBON)

A rare summer resident. Eifrig (1915) saw from ten to fifteen in River Forest, Cook Co., Ill., from May 9 to June 30, 1915 and collected a male with enlarged testes on the last named date; it was recorded again at River Forest, Apr. 24, 1920. Sanborn (1922) collected a specimen at Waukegan, Lake Co., Ill., Apr. 23, 1922, and reported a sight record by Dr. A. Lewy of one in Jackson Park, Chicago, Ill., in June, 1918.

SLATE COLORED JUNCO *Junco hyemalis hyemalis* (LINNAEUS)

A common migrant and a fairly common winter visitant. Among the numbers of Juncos occurring in our area some western forms may be represented to a greater extent than the record shows. See next two forms listed.

Autumn arrival: Aug. 30 (early); Sept. 21 (average). Spring departure: Apr. 25 (average); May 19 (late).

MONTANA JUNCO *Junco oreganus montanus* RIDGWAY

Accidental. Coale (1877) records the first to be taken in our region, secured in Chicago, Oct. 14, 1875 as *oreganus* which was later reidentified by Woodruff (1907) as *montanus*. A specimen (C.A.S. 6081) was taken at Evanston, Cook Co., Ill., Oct. 21, 1898. Kumlien and Hollister (1903) report taking this form in Walworth Co., Wis., Oct. 23, 1898. Brodkorb (1930) took two at Beach, Waukegan, Lake Co., Ill., Apr. 15 and May 1, 1927, which were identified by Dr. H. C. Oberholser.

* **SHUFELDT'S JUNCO** *Junco oreganus shufeldti* COALE

Taken in Lake Co., Ill., Feb. 20, 1887 (Coale, 1887). Woodruff (1907) apparently referring to this specimen gives the date Feb. 26, 1897.

EASTERN TREE SPARROW *Spizella arborea arborea* (WILSON)

A common winter visitant. Probably our most abundant bird in winter. Autumn arrival: Sept. 26 (early); Oct. 12 (average). Spring departure: Apr. 20 (average); May 13 (late).

EASTERN CHIPPING SPARROW *Spizella p. passerina* (BECHSTEIN)

A common migrant and a fairly common summer resident in much of the area considered. However it has become rare in the immediate vicinity of Chicago where formerly it was exceedingly common, nesting in parks, cemeteries and the shade trees of residence districts. Ford has records of fourteen nests, 1888 to 1920, in Cook and Lake Cos., Ill., and Porter Co., Ind.

Spring arrival: Mar. 20 (early); Apr. 12 (average). Breeding: June 12, 1915, Beach, Waukegan, Lake Co., Ill., 3 nests, 3, 4, and 5 eggs; June 9, 1920, La Grange, Cook Co., Ill., 4 eggs. Autumn departure: Sept. 25 (average); Nov. 5 (late).

CLAY-COLORED SPARROW *Spizella pallida* (SWAINSON)

An uncommon migrant. Nelson (1876) classed it as a rare summer resident. It was taken in Porter Co., Ind., May 25, 1919 (Stoddard, 1921a) and in Cook Co., Ill., May 12, 1928 (Brodkorb, 1930). There is a skin in the Academy collection taken at Dunc Park, Porter Co., Ind., May 11, 1924.

Recent dates: May 8, 11, 13, 15, 19, and 25; Oct. 1, 4, and 11.

EASTERN FIELD SPARROW *Spizella pusilla pusilla* (WILSON)

A common summer resident.

Spring arrival: Mar. 15 (early); Apr. 1 (average). Breeding: May 8, 1922, 2 eggs; June 1, 1922, 4 young; June 1, 1926, 4 eggs; July 20, 1928, 3 eggs; Aug. 20, 1933, 3 eggs. Autumn departure: Oct. 1 (average); Oct. 31 (late).

HARRIS'S SPARROW *Zonotrichia querula* (NUTTALL)

A fairly common migrant. Swenk and Stevens (1929) refer to the first definite record from our area, that of Dr. Hoy from Racine, Wis. (Nelson, 1876) and present an increasing number of reports up to 1928 when W. I. Lyon banded eleven birds at Waukegan, Lake Co., Ill. The second recorded appearance in our region was at Riverside, Cook Co., Ill., in 1894; the third in Chicago in 1897; the fourth in Chicago in 1904 and the fifth in Walworth Co., Wis., in 1909. From about that time there is a growth in the number of reports and the number of individuals seen.

Spring: Mar. 14, 1914 (very early); May 5 (early); May 18 (average); May 25 (late). Autumn: Sept. 14 (early); Sep. 23 (average); Oct. 30 (late).

WHITE-CROWNED SPARROW *Zonotrichia l. leucophrys* (FORSTER)

A common migrant.

Spring: Apr. 17 (early); May 1 (average); May 31 (late). Autumn: Sept. 2 (early); Sept. 20 (average); Oct. 24 (late).

GAMBEL'S SPARROW *Zonotrichia leucophrys gambell* (NUTTAL)

A rare migrant. Two were taken at Waukegan, Lake Co., Ill., Oct. 6, 1906 and May 14, 1922 respectively, (Zimmer and Gregory, 1929). Van Tyne (1930) refers to specimens secured in Berrien Co., Mich., May 6 and 13, 1918. There is a specimen in the Academy collection obtained at Waukegan, May 16, 1933, and W. I. Lyon banded eight in that vicinity during the same month.

WHITE-THROATED SPARROW *Zonotrichia albicollis* (GMELIN)

A common migrant and a rare winter visitant.

Spring: Mar. 16 (early); Apr. 2 (average); May 26 (late); June 9 (very late). Autumn: Sept. 6 (early); Sept. 18 (average); Nov. 16 (late). Winter: Feb. 11, 1923; Dec. 20, 1924; Dec. 23, 1931; Jan. 10, 1932.

* **GOLDEN CROWNED SPARROW** *Zonotrichia coronata* (PALLAS)

Taken in Racine Co., Wis., Apr. 1858 (Nelson, 1876).

EASTERN FOX SPARROW *Passerella iliaca iliaca* (MERREM)

A common migrant and a rare winter visitant. W. I. Lyon's banding records reveal the interesting fact that of 1587 birds trapped by him at Waukegan, 425 were captured in spring and 1162 in the fall.

Spring: Feb. 26 (very early); Mar. 10 (early); Mar. 25 (average); May 15 (late). Autumn: Sept. 9 (early); Sept. 25 (average); Nov. 19 (late). Winter: Dec. 15; Jan. 18; Feb. 6, 13 and 16.

LINCOLN'S SPARROW *Melospiza lincolni lincolni* (AUDUBON)

A fairly common migrant. Its possible nesting in our area is indicated by the report that birds of the year were taken in Cook Co., Ill., June 30 and July 16, 1896 (Woodruff, 1907).

Spring: Apr. 10 (early); Apr. 29 (average); May 20 (late). Autumn: Sept. 1 (early); Sept. 15 (average); Oct. 25 (late). Winter: Dec. 26, 1920.

SWAMP SPARROW *Melospiza georgiana* (LATHAM)

Spring arrival: Mar. 30 (early); Apr. 14 (average). Breeding: June 10, 1931, McGinnis Slough, Orland, Cook Co., Ill., 5 eggs. Autumn departure: Oct. 20 (average); Nov. 18 (late). Winter: Dec. 20, 1931.

MISSISSIPPI SONG SPARROW *Melospiza melodia beata* BANGS

A common summer resident; uncommon but regular in winter. The A.O.U. Check Lists ascribes this form to that general region which includes our area. A critical examination of local breeding specimens needs to be made. Forms occupying contiguous ranges may pass through our area in migration.

Spring arrival: Feb. 22 (early); Mar. 12 (average). Breeding: Apr. 25, 1928, 4 eggs; May 5, 1929, 5 eggs; June 15, 1929, 4 eggs; July 26, 1931, 3 eggs. Autumn departure: Oct. 25 (average); Nov. 20 (late). Winter: Dec. 10, 20, 25, 29; Jan. 1, 2, 20; Feb. 1.

LAPLAND LONGSPUR *Calcarius lapponicus lapponicus* (LINNAEUS)

A common migrant and a fairly common winter visitant.

Autumn arrival: Oct. 5 (early); Nov. 6 (average). Spring departure: Apr. 15 (average); Apr. 30 (late); May 16 (very late).

SMITH'S LONGSPUR *Calcarius pictus* (SWAINSON)

An uncommon migrant. There are 16 skins in the Academy collection all taken in Cook Co., Ill., in May 1893, and in Apr. 1896, 1909 and 1910.

Spring: Mar. 23 (early); May 5 (late). Autumn: Nov. 16 and Nov. 29.

* **CHESTNUT-COLLARED LONGSPUR** *Calcarius ornatus* (TOWNSEND)

Rare casual. Listed on the basis of two published sight records. Coale (1910) refers to a number seen at Orland, Cook Co., Ill., Apr. 24, 1910 and Eifrig (1913) to five seen in DuPage Co., Ill., Apr. 20, 1912.

EASTERN SNOW BUNTING *Plectrophenax nivalis nivalis* (LINNAEUS)

A common winter visitant.

Autumn arrival: Oct. 13 (early). Spring departure: Apr. 7 (late).

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Program of Ac of The Chicago Academy of Sciences

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No. 4.



Photograph by F R Dickinson

WILSON'S PLOVER

Pagolla wilsonia wilsonia

This trim little plover is a common bird of our southern states. It nests along the sandy shores of lagoons bordering the Gulf of Mexico and the Atlantic Ocean; its three protectively colored eggs being deposited in open places. An excellent motion film was obtained of this bird on the recent Academy field trip to Florida.

The Chicago Academy of Sciences
LINCOLN PARK AT CENTER STREET
CHICAGO

DR. COWLES ELECTED FELLOW OF THE ACADEMY

The Board of Trustees at their annual meeting April 12, 1934, upon recommendation of the Scientific Governors, unanimously elected Dr. Henry Chandler Cowles a Fellow of The Chicago Academy of Sciences. It was with regret that the officers accepted Dr. Cowles' decision that, owing to ill health, it would be necessary for him to discontinue his active services. He became associated in the Academy work first through his popular botanical lectures in the schools and in the Academy. He became Vice-president in 1912 and President on January 10, 1922, and has served continuously since that time. Dr. Cowles is loved by thousands of his students throughout the country who unite in hoping that he will soon be able to resume his former activities.

MR. J. R. OFFIELD AND MR. J. F. PORTER ELECTED TRUSTEES

Mr. J. R. Offield and Mr. James F. Porter, two well known Chicago men, with life-long interests in natural history and conservation, were elected Trustees of the Academy at the annual meeting of that Board on April 12, 1934. At the same meeting Mr. Lloyd A. Laffin, Mr. Paul Steinbrecher, and Mr. Bruce Borland were re-elected Trustees. The Nominating Committee presented the names of Mr. L. C. Walker for President, Mr. Paul Steinbrecher for Vice-president, and Mr. A. J. Lindstrom for Treasurer of the Board of Trustees, and the Secretary was instructed to cast an unanimous ballot for their election.

ANNUAL MEETING

The seventy-seventh annual meeting of the Academy was held in the lecture hall Monday evening, April ninth. There was a large attendance of members and friends. Mr. F. R. Dickinson, Vice-president, presided, as Dr. Cowles was unable to attend, owing to illness. After the reports of the Secretary, Dr. Nathan S. Davis III; the Treasurer, Mr. Austin J. Lindstrom; and the Director, Mr. A. M. Bailey, were read, the results of the annual election were announced as follows: President, Francis R. Dickinson; First Vice-president, Dr. Edmund Andrews; Second Vice-president, Dr. Fay-Cooper Cole; Secretary, Dr. Nathan S. Davis III.

An unusual program was offered the members by three scientists of Northwestern University in a discussion on Earth History. Dr. Oliver J. Lee, Director of the Dearborn Observatory, spoke on the Astronomical Evidence and Cosmogonic Theory; Dr. Charles H. Behre, Jr., Chairman of the Department of Geology, told of The Unstable Crust; and Dr. John R. Ball, Associate Professor of Geology and Invertebrate Paleontology, gave Significant Life Changes during Geologic Time. At the conclusion of the talks, a round table discussion was held; the opportunity to question the speakers was appreciated, apparently, judging by the numerous responses.

AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during this season in the Assembly Hall, Sundays, at 3:00 P. M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

Oct. 28 Birds of Mountains and Plains

Mr. Robert J. Niedrach

The varied bird life of Colorado, from the low semi-arid regions to the peaks of snow-covered mountains, will be described by Mr. Niedrach, one of the foremost ornithologists of the west. The speaker is a naturalist of the Colorado Museum of Natural History.

Illustrated with Motion Pictures

Nov. 4 America in Natural Colors

Mr. F. P. Clatworthy

The speaker is recognized as one of the outstanding natural color photographers in the country. He has traveled extensively and many of his beautiful photographs have appeared in leading publications.

Illustrated with Natural-color slides

Nov. 11 Afield with a Botanist

Dr. V. O. Graham

The outdoors man finds something of interest at any season of the year. Dr. Graham, Scientific Governor of the Academy, will tell of the flowers and trees to be found in our area.

Illustrated with Slides

Nov. 18 To the Arctic on the Bowdoin

Dr. W. A. Thomas

Journeys to Labrador, Greenland, and the ice-filled waters of the North Atlantic on the famous vessel "Bowdoin" will be described by the speaker. Dr. Thomas has had many years' experience in the field and his accounts of his trips to the Arctic are of unusual interest.

Illustrated with Motion Pictures

Nov. 25 Over African Game Trails

Mr. William J. Cameron

Another member of our Academy has journeyed to the far places beyond the beaten path. Mr. Cameron has made many expeditions to obtain photographs of big game. He will tell of trekking through forests and over prairies abounding in large mammals.

Illustrated with Motion Pictures

Dec. 2 Rediscovering Illinois

Dr. Fay-Cooper Cole

Dr. Cole, Vice-president of the Academy and Archaeologist of The University of Chicago, has had a life long interest in primitive man. He has traveled to the jungles of the Far East on many field trips, but on this occasion he will tell of the people who lived in Illinois before the arrival of the white man.

Illustrated

Reserved seats will be available to members until 3 o'clock.

BUTTERFLIES FROM THE ARCTIC

Far north in the Arctic Ocean off the north coast of Alaska lies Barter Island, approximate latitude 70° North, longitude 144° West. From this Arctic Island there has come to the Academy a small but exceedingly interesting collection of butterflies, and one brightly colored moth. All were captured there during July and August 1931. The following are the species represented:

Eurymus hecla, race *hecla*, Strecker
Oeneis brucei, race *yukonensis*, Gibson
Brenthis chariclea, race *arctica*, Zetterstedt
Brenthis frigga, race *alaskensis*, Lehm
Hyphoraia lapponica, race *alpina*, Quensel

These specimens came to the Academy through the kindness of Mrs. Henry W. Greist, of Barrow, Alaska.

The capture of the same species was recorded in the report of the Canadian Arctic Expedition of 1913 to 1918. Collections were made on Barrow Island as well as the nearby mainland and other points in the Arctic region. In that report it is stated that butterflies are more plentiful in early afternoon on bright days flying over the tundra with temperature approximately 50 degrees above zero. In the vicinity of Chicago, even under the most ideal conditions, it is most unusual to see a butterfly in flight at such temperatures.

Brenthis and *Hyphoraia* species in the more temperate regions pass the winter in hibernation as larvae and the *Eurymus* group as pupae. It is probable that they do likewise even in the Arctic and speaks well for their ability to withstand cold. It has been stated that hibernating insects will survive a temperature of 50 degrees below zero.

A. K. Wyatt
Chicago Entomological Society

FILM LIBRARY

Many thousand feet of film negatives were added to the library on field trips of the Academy. The collection of bird photographs is fast rounding into a representative one of the birds of the United States. It has been found necessary to make provision for additional storage space in the film vault.

PARAMOUNT has released in its Pictorial reel some of the strange birds filmed on the Academy Labrador Expedition in 1932. Among the subjects which are being shown throughout the country are the black-backed gulls, puffins and gannets.

FIELD WORK

Louisiana

At the invitation of Dr. T. Gilbert Pearson, President of the National Association of Audubon Societies, Mr. F. R. Dickinson and Mr. A. M. Bailey spent two weeks in January at the Paul J. Rainey Wild Life Sanctuary in the heart of the Marsh Country in Vermilion Parish, Louisiana, filming the ducks and geese which take refuge there. Mr. Dick Gordon, Supervisor of the Sanctuary, had erected blinds and had scattered rice before them, so that hundreds of wild fowl were congregated. Four thousand feet of film was made of the birds: scaup, ring-necked ducks, mallards, pintail, and blue geese, and of the activities of the Sanctuary.

Tennessee, Georgia and Florida

For the past two years E. V. and Roy Komarek have been making a natural history survey in the Smoky Mountains of Tennessee with the cooperation of the National Park Service. In January, they extended their field of activity to southern Georgia and Florida. Through the courtesy of Mr. Herbert L. Stoddard, they made Sherwood Plantation in southern Georgia their base for collecting in that region, and an extensive series of southern mammals was secured. Several months were spent in Florida, during which time, twelve thousand miles were traveled over many types of roads; they collected specimens from Cape Sable to the northern boundary, and secured extremely valuable collections for the study series. Sixty-seven species and subspecies of mammals were secured, forty-two of which were not represented in the Academy collection, and one hundred and eighteen species and subspecies of birds, of which twenty-five were new to the collection. In addition, almost one hundred and twenty-five reptiles and amphibians were taken. The Academy is indebted to the Florida Department of Conservation for its cooperation. In May, Dr. and Mrs. N. S. Davis III spent approximately two weeks in the Smokies with the Komareks, and F. R. Dickinson and A. M. Bailey joined the group during the latter part of their stay. Motion film of the beautiful scenery, the cloud-topped mountains, the dogwoods in bloom, the rushing torrents, and nesting birds, were secured. A ruffed grouse was photographed upon its eggs, and the little mountain vireo was filmed while it made its nest.

Dickinson and Bailey worked on the Sherwood Plantation in southern Georgia for several days and were guests of Mr. and Mrs. Herbert L. Stoddard. While there, they made photographs of the rare limpkin, as well as several other species not heretofore represented in the film library.

Continuing southward, the photographers used several thousand feet of negative in filming the birds of Central and Eastern Florida. Studies of American egrets, white ibis, black-necked stilts, Wilson's plover, Florida burrowing owl and chuckwill's widow were secured through the cooperation of Oscar E. Baynard, veteran ornithologist of Plant City, Florida, and his assistant, Leonard Cason. These naturalists are thoroughly familiar with the nesting haunts of many rare species, so they were able to render services of the greatest value. Merritts Island, with its

extensive hammocks of cabbage palms, on the east coast of Florida, was an especially fine place for photographic work. It may be of interest to members of the Academy to know that Florida was the scene of extensive field work by Academy field parties of an early day. Dr. William Stimpson and John W. Velie made three expeditions in the '70's collecting wonderful specimens for the Academy's study series. Unfortunately this material was destroyed in the great Chicago fire.

The Academy has cooperated with the Illinois State Natural History Survey at Urbana, under the direction of Dr. T. H. Frison, in making motion films showing the valuable work being performed for the state by that organization, particularly in its relation to insect control. The first subject showing control and its importance to agriculture was on the chinch bug. Millions of dollars of damage were caused farmers by these insects this past season, and the film is designed to aid the farmers in control work. It is planned to distribute these in rural communities through the granges. The fisheries of the state, the birds, and mammals will be other subjects to be treated.

During July and August Mr. Dickinson secured over one hundred negatives of plants typical of this region. A photographic exhibit is planned which, it is hoped, will serve to arouse an interest in botany among visitors to the Academy.

Messrs. Tappan Gregory, Honorary Curator of Mammals, and Francis R. Dickinson are at the present time on a photographic trip in the south, accompanied by Dr. Wm. H. Hazlett, Mr. Robert S. Sturgis and Mr. Stanley P. Young, Chief of the Division of Game Management of the United States Bureau of Biological Survey. They are now in southeastern Arkansas and plan to go over the border into Louisiana in an attempt to obtain, with set cameras, pictures of the gray wolf, one of the shyest of all mammals. Mr. A. E. Gray, District Agent of the Biological Survey, Mr. Gilchrist, Regional Supervisor, and hunters, Andy Ray, Jr. and Clyde Briggs are cooperating in the work. These men have been on the lookout for trails on which the wolves are running with some regularity. If, however, efforts to secure flashlight photographs are unsuccessful near the Arkansas-Louisiana line, the party will journey into the Ozarks of Oklahoma. The camera-hunters expect to be gone six weeks, and although the gray wolf is the main objective, there are many wild animals in that region which would make welcome subjects. If there is sufficient time remaining, they may travel on to the Tonto Basin in Arizona in search of mountain lions.

Photographing animals with set cameras is one of the most interesting of all outdoor pursuits. Cameras are placed along good trails, where the animals will touch wires and set off the flashlight charges, or baits are tied to triggers which, when disturbed, automatically fire the flashes. Mr. Gregory has obtained a very fine collection of night photographs in this manner, and he will use some of them to illustrate *The Mammals of the Chicago Region*, which we hope to publish next year.

CONSERVATION OF WILD FOWL

The season for taking ducks is now open. There has been a great alarm for the welfare of our wild fowl because of the serious drouth which has increased the damage to nesting areas done by man in draining lakes and marshes. The decrease in numbers of ducks is so great that the problem of protecting the breeding stock is a national one. I have seen little comment in writing on the open season granted by our administration, but I have heard the comments of many sportsmen who are alarmed at the prospects of our exterminating some species of migratory fowl.

The appointment of Mr. J. N. Darling as Chief of the Biological Survey was a welcome one, for with that Bureau rests the investigations upon which we should base our actions regarding protection. Mr. Darling has an enviable reputation as a conservationist. He is known as a sportsman who believes in giving the wild fowl a chance. Consequently, I do not understand the federal authorization allowing states fifteen week-ends of duck shooting, if they so desire, if danger to our breeding stock is as great as has been reported.

It is my understanding that, in order to have an authentic check on conditions, a thorough survey of the duck breeding areas was made by representatives of the Survey, and that the report submitted was very discouraging.

Some of the foremost field naturalists of the country were delegated to visit the breeding grounds of wild fowl so that accurate data might be assembled, and intelligent regulations for the protection of our migrating game birds promulgated. It was found, I understand, that in regions where ducks were most successful, the most optimistic reports were that the duck crop was only 80 per cent normal. In other regions the percentage dwindled to the zero mark. One skilled field man spent three weeks traveling in South and North Dakota and Montana, visiting favorable nesting places of other years and he had a grand total of three ducks' nests for his efforts. It can be safely said that the ducks' nesting season was practically a failure south of the northern limits of agriculture, probably the most disastrous season our game birds have known.

With such a report from field naturalists, it seems to me that our interests as sportsmen would have been better served had we foregone the privilege of shooting for the season, and given the birds a chance to regain ground. As individuals we would not go out on our farms and kill off our breeding stock; but as a group, we are slaughtering the few birds that have succeeded in overcoming the odds that are against them. However, because of the expected returns from the "duck stamp", one dollar for each duck hunter, and the revenue needed by State Conservation Departments from license fees, it is probably expecting too much to give the ducks respite for a season, especially as the funds from the "duck stamp" are intended for purchase of marshland. But surely, if it were necessary to have an open season of thirty days, it was questionable to allow fifteen consecutive week-ends, two days a week, so that hunters, as one of the Chicago papers so naively put it, "may now spend two days a week in the field, and follow the ducks throughout the season, from the northern part of the state to the southern."

There will be a concentration of birds on favored waters this season, due to the drouth, for the birds have few places to go. Consequently, there will be a cry from selfish individuals that there are more birds this year than in past seasons; that Biological Survey investigators do not know their business, or have overlooked the best breeding areas. But ask those who have lived in marsh regions which were once ideal nesting grounds, where clouds of dust now rise with every vagrant wind and you will have a different story.

It is my opinion that this season of fifteen consecutive week-ends which Illinois, and doubtless other states have chosen, will cause irreparable injury to our wild fowl for several reasons. For one, the season instead of having been shortened has actually been doubled! The average shooter is limited to week-ends and when the season was sixty days, he had about eight opportunities at best. And now he has fifteen. It will be practically impossible for wardens to enforce the five days of closed season each week, and so there will be continuous law violations. As a hunter, I appreciate the opportunity to be afield, but as one interested in having something to shoot in years to come, I seriously question the wisdom of authorizing such a season. It is my prediction that if the drouth continues into the open season, we will witness a killing that will be regretted for many years. With the birds baited to a few remaining water holes, they will be concentrated in limited areas. They will be fed at the shooting holes and be lulled into false security with live decoys for five days, and blasted the sixth and seventh. It does not seem to me that we are playing the game. I have hunted wild fowl from the Arctic Coast to the Gulf of Mexico, and I have always understood the sportsman's code to be one where he gave his target a chance for its life. And now, we are in the position of quail hunters who are searching out the last birds in the covey. Only a comparative few of the birds are left, and twice as many actual shooting days are being allowed to see that we "clean them up." Sixty days of consecutive shooting would have been less disastrous than the week-end shooting allowed in many states.

We are feverishly spending money to acquire marshlands for breeding and nesting areas. "Game management" is becoming a byword, but I am wondering if, now that nature has taken a hand in diminishing the flocks, we should not extend our activities to *human management*. It is much easier *not* to shoot a duck than to shoot it, so the easiest way to build up the breeding stock would be to have no hunting for a season and give nature a chance. I believe such a program would do far more good than will all the lands we secure with the income derived from the first five years of the duck stamp tax.

I like to shoot. Perhaps I am too selfish in hoping that the few birds remaining be given a chance, that I may continue to go afield with the expectation of seeing flocks of hurrying wild fowl against the rising sun.

A. M. Bailey



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of the Chicago Academy of Sciences)

AUTUMN MEETING

The autumn meeting of the Illinois Audubon Society will be held jointly with the Inland Bird Banding Association, Saturday evening, October 27, in the Academy lecture hall. All members are urged to attend and to bring their friends. It should be a fine "get-together" for many members of the American Ornithologists' Union will doubtless be in town. The program will be an excellent one. At 7 p. m. President Wm. Lyon of the I. B. B. A. will call the meeting to order and interesting notes of the year's activities will be given. At 8:15 Mr. Robert J. Niedrach, of the Colorado Museum of Natural History, one of the foremost ornithologists of the west, will give a lecture illustrated with fine motion films and slides. The speaker has cooperated with the Academy in making thousands of feet of the film of Colorado birds in the Academy film library, and will show new film under the title "Birds of Mountains and Plains".

Many members plan to meet at the Academy in the late afternoon and have dinner in nearby restaurants.

THREE NOTES FROM THE BARRINGTON BIRD CLUB

THE BITTERN'S COURTSHIP DANCE

In developing our acquaintance with the American bittern we have seen him often in his natural habitat in the Donovan swamp near Barrington. We have seen him pose among the reeds to demonstrate his protective coloration and we have seen him and his companion on the wing. Three of our party have waded out and found a nest, and experimented a bit with young "half-grown". By sheer good luck and some persistent watching we have had the glasses on him when he "pumped", as we call the characteristic call.

On the way home from Waukegan, in June, we stopped along the roadside by the swamp and went over the territory with several pairs of glasses to see what we could pick up. We watched a pair of bitterns for about an hour. The male was showing his best struts and best steps. He drooped his wings somewhat and fanned out his tail, but most remarkable was the star of white feathers surrounding his neck quite near the head when the neck was stretched up. Beautified in this way, he stepped about rhythmically, circling the female in an interesting dance, pausing to play his feathers up and down. She seemed to pay no attention to all this, feeding steadily and even moving off at times. The ceremony continued for about forty minutes and was observed at dusk. We have found only one reference to this behavior of the bittern and would be interested to hear of others who have observed it, especially the white feathers.

Edna Stout

AN EXPERIENCE WITH BIRDS

When spring comes, one of my favorite birds, the flicker, builds his nest in an old choke-cherry tree which is shaped like a wishbone. He calls and builds—and is ousted by the starlings who take full possession of the nest, and I have seen them fight so hard that they fell to the ground.

Mr. Donovan shot one of the starlings and the next day the other was back with another mate. After this happened three times, Mr. Donovan put up a new flicker house. In the meantime the flickers were back and forth to the choke-cherry nest when the starlings were absent. When the new house was up, the flickers went there, but again were ousted by the same starlings. Two were shot but new mates were brought until a swarm of bees occupied the new house and ousted the starlings. The flickers found a hole in an oak tree situated between the choke-cherry and the bee-hive, and there hatched their young ones.

Two years ago a pair of squirrels had their family in the same oak tree.

Martha Donovan

MY FEATHERED FRIENDS

For two weeks in early spring a screech owl sat in an oak tree about fifty feet from our door much of the time. The bird never seemed to move, except its head, when I would go under the tree and call to it.

At the end of the second week I missed it one morning, and after looking all around the yard I decided it had left us. The same evening standing at the open window my eyes fell on a grey face with big eyes in a woodpecker's box not far from the house. Some members of the Bird Club came to help me identify the bird. Mr. Stout put a ladder against the tree and I climbed up and after closing the hole with some paper brought the box down.

While we stood back, not knowing what to expect, William took off the top of the box, and there were five baby owls, three grey, and two brown like the mother, or perhaps it was the father, that sat in the tree so long, guarding the young. After admiring the cute little fellows we put them back in the box and replaced it in the tree.

But the next day I had so many callers to see the new family I decided to leave the box down for a day or two. Fearful that the mother bird would not find the box on the ground, we put it back. It took about a week before the last one left the nest, but the old one still comes around the house in the evenings and sometimes in the early mornings I hear it call or cry.

I am only waiting for another spring, hoping the owls will nest there again. Then I hope to have them banded.

Olive McDowell.

NOTES FROM AUDUBON'S LABRADOR

[An excerpt from a letter written June 4, 1934, by Fred W. Osborne, light house keeper, St. Mary's Island Bird Sanctuary, Canadian Labrador, to A. M. Bailey.]

"We came here to the light by dog team April 23rd, and the ice connecting the Island to the mainland did not break up until May 21st, after a heavy gale from the southwest. After a severe winter, spring came quite fast and with it numerous of our bird friends, such as the eiders, auks, puffins and murre. They are all busy fixing up their old places. We have a couple of horned larks coming to look for bread every morning and evening, and I feel sure they are the same ones that have been here for several years, for they watch the door and wait for their food. I saw the first early in May. I was standing by the kitchen door watching some land birds coming in from seaward and this one little fellow circled around and landed at my feet. I shouted to the children that our lark had returned and they rushed out with bread. As soon as the bird saw the food, it hopped right up and had its feed within three feet of where we were standing. I honestly believe it's the same one I wrote of some time ago. [See Program of Activities, Vol. 4, No. 1.] I wish that I had banded it so I could be sure."

PIED-BILLED GREBE ON FISHING LINE

James and William Beecher, who operate a banding station on Pistakee Lake in the Lake Region of northern Illinois, had an unique experience recently. They had a pole set at the end of a pier, baited with a golden shiner in anticipation of a pickerel or crappie. After a brief absence they returned to find something heavy pulling on the line. On taking it in they found that the animated mass of feathers attached to it was a very lively and protesting pied-billed grebe. He did not seem to be injured, so he was banded and placed at the end of the lake. The grebe was off in a flash with barely enough water to wet him; in six inches of depth he was already submerged, scraping the bottom in his headlong rush. A few moments later he rose to the surface about forty yards out, only to dive again after a reproachful look shoreward.

The grebe did not appear injured from its unique experience, so it is possible that some one will make an interesting return on this banded bird. Mr. W. I. Lyon reports that it is difficult to catch diving birds and so, very few grebes or loons have been banded.

The Biological Survey has recently published an account of birds banded and returns recorded which gives an interesting insight into the activities of the workers in this valuable branch of field investigation.

SPECIAL NOTICE

AMERICAN ORNITHOLOGISTS' MEETING

Local naturalists will have the privilege of meeting the foremost ornithologists of the country when the American Ornithologists' Union assembles for its annual meeting which will be held at the Field Museum during the week beginning October 22, 1934. The Stevens Hotel will be headquarters for guests.

The Local Committee on Arrangements consists of members of various scientific organizations of the city, comprising the following members: W. H. Osgood, Chairman, A. M. Bailey, Rudyerd Boulton, H. B. Conover, C. W. G. Eifrig, S. S. Gregory Jr., W. I. Lyon, and R. M. Strong. Information regarding the meeting which is open to the public may be obtained from any of the above, and anyone desiring to affiliate with the A. O. U. may obtain application blanks at the Academy.

ANNUAL BULLETIN

The officers of the Audubon Society desire to publish the Annual Bulletin as early in January as possible. Please send accounts of your experiences with birds to the Academy. Affiliated groups should make a report of their activities so others will know of Audubon work throughout the state.

Catherine A. Mitchell

Program of Activities of The Chicago Academy of Sciences

Vol 6

January 1935

No 1



Photograph by E. G. Wright

THE CHINCH BUG

The grain fields of many mid western states are ravaged by many insect pests but one of the most destructive is the chinch bug (*Blissus leucopterus*) countless thousands mass upon the growing corn causing millions of dollars damage annually

EVENING LECTURES

Where Rolls the Oregon

The winter meeting of the Illinois Audubon Society will be held Thursday, January 10, 1935 in the Academy lecture hall at 8 p.m. Mr. William L. Finley, one of the leading lecturers of the country and an old friend of the Society, will show his new film under the above title. Those who never heard Mr. Finley should not miss the opportunity. Those who have, will not need this advice.

All members of the Society and the Academy are urged to attend, and to bring their friends.

Birds of Mangroves and Palms

The mid-winter meeting of the Academy will be held on Thursday, February 14, 1935, in the lecture hall at 8 p.m. Motion films made by Mr. Francis R. Dickinson and Mr. Alfred M. Bailey on recent field expeditions of the Academy will be shown by Mr. Bailey. Photographs of beautiful scenery and of animal life were made from the great Smoky Mountains of Tennessee to the Florida Gulf Coast during the past two seasons. Members are urged to attend and to bring their friends. Groups of members are accustomed to meet at the Academy in the late afternoon and to have dinner in nearby restaurants. Plan to come early on January 10 and February 14.

ALASKAN FIELD WORK

Charles D. Brower reported that unusually severe conditions prevailed in Arctic Alaska this past summer, and due to heavy snowfall in July, thousands of young wild fowl perished. Mr. Brower was unable to carry on his usual field investigations owing to an injury to his son's eyes. An airplane was obtained from Fairbanks, and Mr. Brower and his son, David, made the long flight from Barrow, three hundred miles north of the Arctic Circle, to San Francisco. They arrived without accident, and the injured eyes responded to treatment, so the Browsers returned to Nome on the last vessel and flew the eight hundred miles to Barrow.

Dwight Tevuk, the Eskimo naturalist, at Cape Prince of Wales, continued his field work in July, obtaining a small collection which included a few rare specimens. Of unusual interest was a breeding Kittlitz murrelet which was found, with a single egg, on a mountain top. Unfortunately, Tevuk did not realize the importance of his find and, as the egg was broken, did not preserve it. This species has only been found with its egg on one other occasion, and that time on Pavlof Volcano on the Alaskan Peninsula. The birds appear in some numbers in the ice-filled waters of Glacier Bay, but their nesting sites have remained undiscovered in spite of the efforts of naturalists to find them.

WINTER PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during this season in the Assembly Hall, Sundays, at 3:00 P.M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

Jan. 27 Adventures with Bow and Arrow

Mr. Art Young

Mr. Young has hunted big game with the bow and arrow from Alaska to Africa. He will give a brief history of the bow and will tell of his hunting experiences.

Illustrated with Slides and Motion Pictures

Feb. 3 Timbuktu and Beyond

Mrs. Laura C. Boulton

The "far places" have been visited by Mrs. Boulton in her studies of primitive people and their music. On a recent expedition she crossed the Sahara and studied the people living along the Niger.

Illustrated

Feb. 10 The Forgotten Specialty

Dr. Nathan S. Davis, III

Dr. N. S. Davis, Secretary of the Academy, will speak of the work of the family doctor. Family practice is the most important but the least appreciated of medical specialties.

Feb. 17 Birds of Mangroves and Palms

Mr. Alfred M. Bailey

Mr. Bailey, Director of the Academy, will speak on the birds of Florida and of the Smoky Mountains of Tennessee. The films were made on an Academy field trip last spring.

Illustrated with Motion Pictures

Feb. 24 Wonderlands of the South

Dr. Louis J. Tint

The beautiful flowers of the southland offer ideal subjects for natural color photographs. Dr. Tint will show them in illustration of his recent field trip.

Illustrated with Natural-color slides

Mar. 3 By Caravan through Abyssinia

Mr. C. J. Albrecht

The speaker has traveled in many lands. He will tell of his journey through little known Ethiopia into the game fields of Kenya.

Illustrated with Slides and Motion Pictures

Reserved seats will be available to members until 3 o'clock.

THE CHINCH BUG IN ILLINOIS

By Theodore H. Frison

Chief, Illinois State Natural History Survey, Urbana, Illinois

The chinch bug (*Blissus leucopterus*) is one of our native insects which periodically causes great losses to corn, wheat, oats, barley, and rye. Ever since grain crops have been grown on our Illinois prairies these small but destructive insects have exacted a toll from our farmers. Sometimes the damage to crops is small but at other times it amounts to an astounding figure.

Chinch bug outbreaks of serious proportions usually run from a period of two to five years depending upon seasonal conditions. Dry years with few hard pelting rains during the spring and early summer are most favorable for a maximum increase of chinch bugs. This past summer, which was characterized by a record drought and heat, there occurred a great outbreak which severely reduced the grain crop in a large percentage of the counties of our state. The outbreak was due in large part, in addition to the favorable weather of this past season, to the fact that an enormous chinch bug population was carried over last winter resulting from the two previous exceedingly favorable years for chinch bug development.

Habits and Life History

The life history of the chinch bug is not much different fundamentally from many other Illinois insects with sucking mouthparts. The full grown chinch bugs, which are a little less than a quarter of an inch in length, hibernate from about the first of November until about the middle of April in any sheltered and protected place that they can find. Hedge rows and areas well covered with grasses are favorite hiding places. During this period of rest the bugs do not feed. During warm and favorable days in early spring the bugs leave their winter quarters and fly to fields of succulent grasses and small grains. After a short period of feeding the bugs mate and the females then begin to lay eggs on their plant hosts. A female may lay from fifteen to twenty eggs in a single day. Egg laying may go on for about a month but is usually interrupted from time to time.

By the first of summer most of the old bugs are dead but they have been replaced, if conditions are favorable, by a horde of descendants. In the latter part of June and the first of July the small grain crops begin to dry up or are cut and the young bugs are forced to move elsewhere for their food. It so happens in the Illinois scheme of agriculture that corn affords at this time an excellent host for the chinch bugs migrating from the fields of small grain or grasses.

During the remainder of the summer the bugs remain in the cornfields where the second brood is produced. The second brood starts flying from cornfields in search of winter quarters about the last of August and this flight continues during succeeding warm days in fall.

This general sketch of the life history shows that we have two broods of chinch bugs every year and that one of them over-winters in the adult stage.



Photograph by E. G. Wright

PLACING CREOSOTE ALONG UPPER PART OF BARRIER

Control Methods

Since corn at a low ebb of agricultural prices had a value in Illinois of over 58 million dollars in 1932, contrasted with a high value of over 219 million dollars in 1929, it is highly important that chinch bugs be controlled as much as possible during years of severe outbreaks. The manner in which corn is grown in large tracts and the prices which the final product brings leave the individual farmer with no margin for expensive control measures regardless of the total value of the crop. Therefore, such control measures as spraying and dusting, which are practical for the control of certain insect pests, are impractical.

The fact that most chinch bugs walk to nearby cornfields when leaving the small grain in early summer offers an opportunity for their partial control. The entomologists of our Survey have been largely responsible for the development of practical and inexpensive barriers which will prevent chinch bugs from entering cornfields when they leave the drying or cut fields of wheat, oats, barley, and rye. Various types and forms of barriers have been developed. One of the cheapest and most effective barriers is formed by plowing up an earthen ridge between the cornfield to be protected and the grain field which the bugs are leaving and then applying a small solid line of repellent creosote along the upper part of the earthen ridge. This barrier is further improved by making post holes in order to trap

the bugs at regular intervals in the plowed furrow. Various modifications and perfections of this general type of barrier are used but their description is not necessary here.

In addition to barriers there are other aids which man can utilize in reducing the amount of damage that chinch bugs do. The burning of bugs when in their winter quarters is helpful at times and under certain conditions but is not recommended under all conditions and in all places because of other economic factors involved. Reduction in acreage of certain crops highly susceptible to damage and the substitution of other crops not subject or less subject to attack by chinch bugs are important. Soy beans, for instance, have been rapidly forging ahead as a crop in central Illinois and are immune from chinch bug attack as are other leguminous crops. Some varieties of corn are more capable of withstanding the attack of the second brood of chinch bugs than are other varieties, and the Survey, as a result of experimental data and field observations recommends the planting of different varieties of corn in various parts of the state and under certain soil conditions.

Services of the State Natural History Survey

The State Natural History Survey is a scientific organization charged by the code of the State of Illinois with making scientific investigations of a varied and broad nature concerning the plants and animals of this state. The Survey is also charged with developing, if possible, means of controlling injurious plant or animal pests and aiding with the improvement and intelligent development of our renewable organic natural resources.

Our work with chinch bugs during the past summer is an excellent example of how such a scientific organization serves the commonwealth of Illinois. Our entomologists during the winter and early part of last year demonstrated how barriers are made. These demonstrations were made at forty-three meetings covering the territory of approximately forty-six counties. Farm Bureau advisors modeling their meetings after ours held over one hundred additional meetings. Thus by meetings—a single meeting was sometimes attended by over four hundred representative farmers—by press releases, through the newspapers and farm bureaus, by radio talks, etc., a large number of our farmers were early warned of the chinch bug threat of this past year and the simple, cheap methods which could be followed to reduce the damage which this insect was likely to, and did cause.

From accurate figures furnished by various county leaders we know that during last summer 3,064,450 gallons of chinch bug barrier material were used in Illinois and that 22,408 miles of barrier were constructed. About 7,000 miles of chinch bug barrier were constructed with creosote supplied free to the farmers of Illinois as a result of a Federal appropriation. Over 15,000 miles of barriers in Illinois were paid for mostly by the farmers themselves and about one-seventh by State relief agencies. Illinois thus helped itself more than the Federal Government

helped it and in this respect was almost unique among the states with a chinch bug problem.

Very conservative estimates based upon actual field checks and observations indicate that eighteen acres of corn were saved by each mile of barrier. Figuring that the average acre produced twenty bushels of corn (a low figure due to drought and second brood chinch bugs) and with the price at the time of about fifty cents a bushel for corn, the chinch bug program in Illinois accomplished an actual saving, after deduction of cost of barrier material, of approximately \$3,500,000. In other words, the income this year of the farmers of Illinois producing corn is approximately \$3,500,000 more than it would have been without an organized control program.

Of course it would have been impossible to carry on such a program without the cooperation and aid of the Federal and State Departments of Agriculture, Illinois Agricultural Experiment Station, and the various farm agencies. The fact still remains, however, that the scientific background for this effective campaign is a result of research and experimental work of our Survey entomologists over a period of years. Our Chief Entomologist, Mr. W. P. Flint, was chairman of the State Chinch Bug Control Committee. It is also interesting to note that the recommendations developed here were followed in all other states and that our specifications for creosote barrier material were accepted by the Federal Government as standard.

What this year holds for us in the way of chinch bug damage is problematical. We do know that an enormous number of chinch bugs are now in hibernation from which they will come again this spring ready to take up their destructive work. We also know that combinations of weather conditions have in the past broken up such cycles of chinch bug injury as we have been witnessing the past few dry years. Let us hope that this year the pest will again go into a period of decline.

BIRD CITY

E. A. McIlhenny, the southern conservationist, has just published a little booklet under the above title, describing the wonderful heron colony which he has in his dooryard. The author started this many years ago by capturing young egrets. The birds were liberated in the fall, but a few returned and nested the following spring. The colony increased year after year, and now numbers thousands of individuals. Mr. McIlhenny undoubtedly knows more of the life history of the beautiful egrets than any other naturalist, and he has the ability to share his knowledge with others through the written word. In this case, he has taken his grandchildren in a bird blind and the day's events are chronicled and interpreted by the author. Nearly one hundred photographs illustrate the booklet, which was published by the Christopher Publishing House of Boston, Massachusetts. (Price, three dollars.) A copy is available for reference at the Academy.

AT HOME WITH THE BIRDS

A booklet entitled "At Home with the Birds" by A. M. Bailey, illustrated with eight full page color plates, nine by twelve inches, by E. G. Wright of the Academy staff, has just been published and copies are now available for ten cents in all the major chain stores and at the Academy (fifteen cents postpaid if sent from the Academy). The initial printing of twenty-five thousand copies was exhausted, but an additional fifty thousand is just off the press. The booklet tells of the nesting habits of various birds, and the beautiful illustrations include the following species in full color: Baltimore oriole, red-headed woodpecker, cardinal, rose-breasted grosbeak, goldfinch, ruby-throated hummingbird, bluebird, and least bittern, as well as twenty-two photographs by the author.

PHOTOGRAPHIC EXPEDITION SUCCESSFUL

The recent Academy photographic expedition made to Northern Louisiana with the cooperation of the U. S. Biological Survey and of the Department of Conservation resulted in securing remarkable flashlight pictures of timber wolves. Mr. Tappan Gregory and Mr. F. R. Dickinson, Mr. Stanley P. Young, in charge of the Division of Game Management of the U. S. Biological Survey, Mr. A. E. Gray, District Agent of the Survey, and Mr. R. S. Sturgis of Chicago spent three weeks in the field, making their headquarters at Corkran's Camp in the Singer Manufacturing Company's wild life refuge, near Tallulah, Louisiana, in Madison Parish.

The Singer tract of about 82,000 acres lies on both sides of the Tensas River and is cut by numerous bayous. It is all heavily wooded with oak, gum, cypress, and a scattering of other varieties of trees. Deer and wild turkeys are plentiful and there is a fair representation of the smaller fur-bearers.

Six cameras were put out on October 6th, and at 8:30 that night the flash was heard. The picture taken by the flash was a black wolf, and it proved to be the best shot of the trip. Altogether ten cameras were used and twenty-two different sets were made, sixteen of which were for wolves.

The second wolf picture was taken three days after the first and then the wolves moved from the vicinity; it was ten days before they were located and new sets made. All told, five wolf pictures, one very good shot of a spike-horn buck, and three raccoon pictures were obtained, to say nothing of cattle, hogs, dogs, horses, and men, so unfortunate as to set off the flash lights,

The photographic work was made possible through the courtesy of Mr. Henry C. Sevier, counsel for the Singer Company and as on previous field trips to Louisiana, through the assistance of Mr. Robert Maestri, head of the Louisiana Department of Conservation.



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of the Chicago Academy of Sciences)

DR. PEARSON BECOMES PRESIDENT EMERITUS

After thirty years devoted to the cause of wild life preservation, Dr. T. Gilbert Pearson recently expressed his desire to be relieved of the executive responsibilities of the National Association of Audubon Societies, to the upbuilding of which he has devoted his life.

The Board of Directors expressed its great regret at his decision and on October 30, in recognition of his life-long service to the Association, elected him its President Emeritus.

During the twenty-four years in which Dr. Pearson has been the executive head of the Association, the organization has become the most strongly financed and most widely-known wild life protective society in the world. He has been actively identified with virtually all wild life conservation achievements during the most active and progressive period of conservation development in this country.

Dr. Pearson will continue to serve the Association's interests, devoting his time to its international activities, lecturing, writing, helping in legislative effort, and aiding in spreading policies of wild life protection.

Mr. Kermit Roosevelt was elected President and Mr. John H. Baker, who has been since December, 1933, Chairman of the Board of Directors, was elected Executive Director.

THE BAYOUS OF THE TENSAS

In the northeastern corner of Louisiana, about forty miles west of the levees which impound the Mississippi River, lies a tract of timber so nearly untouched by the ax and saw that a naturalist, following one of its many game trails, can almost imagine himself back in pioneer days. Near this spot survivors of La Salle's ill-fated colony on the Gulf Coast passed by on their long and arduous march to the southern outposts of the French fur-traders; and though the trials of that journey must have dimmed their eyes to the beauty of their surroundings, one must envy those wanderers for the sight of such a forest while it was still primeval.

Last October, on the invitation of the Academy's Honorary Curator of Mammals, Mr. Tappan Gregory, I spent two weeks in this section with him in a trapper's cabin. Mr. Gregory was on a vacation trip made in the hope of obtaining flash-light photographs of timber wolves. He got his pictures, but how, and with what tribulations, is not my story. I can only contribute a few random impressions of the surroundings in which he carried on his work.

The area is now leased to the State of Louisiana as a game refuge. Being flat and well below the floor level of the Mississippi, it would no doubt be inundated at frequent intervals save for the protection of the main levees. It is drained by the Tensas (Tensaw) River, into which lead numerous bayous, filled to the brim in rainy seasons, but at other times mere shallow draws, with a trickle of water connecting the few scattered pools. Along and between these water-courses stands virgin timber of oak, cypress, gum, honey-locust, and many other species, which provides an abundance of protection for the wild life dwelling beneath its shade. The forest floor is mostly clear of underbrush, except for patches of crisp palmetto, occasional brambles and vines, and here and there the debris of a moldering tree trunk, broken and scattered by bears or wild hogs in their search for grubs. Deer runs lead in all directions—to the river, to some water-hole, to a favorite feeding ground, or to one of the many salt licks where from dusk to dawn of a cool autumn night the deer come and go, leaving the mud pitted with hundreds of tracks.

At one of these licks, open to the sky but hemmed in by ancient cypress trees, I had the luck, proverbial for the novice, of seeing one of the rarest and most striking of native birds, the ivory-billed woodpecker. In this region it is making a last stand, and I have been told that at least one pair might at times be seen near this particular lick. For about an hour in the late afternoon I had been waiting in a blind, on the chance of seeing a deer, when a knocking near the top of a cypress tree drew my attention. The bird was in full sight, its size alone was enough to distinguish it from other woodpeckers, but fortunately I had a plain view of the large, whitish bill which, at least to my own satisfaction, made the identification complete.

Bird life in this forest, especially near the few clearings, was so plentiful and so vocal that October seemed like April. Through the moonlit nights the liquid and resonant calls of barred owls came like echoes from the deep woods. Waking

at daybreak on the porch of our little cabin we could almost have set our watches by the first notes of cardinals and Carolina wrens. All day long pileated woodpeckers alternated their hammering with rapid and monotonous cries. From our front steps we frequently saw three black vultures and a loggerhead shrike watching us from nearby trees. Two of the party, while fishing on the Tensas River, identified a young golden eagle; and in a neighboring marshy pond we saw about twenty white pelicans, a few American egrets, and large numbers of the little blue herons. Wood ducks still nest here, though in diminished numbers, and on several open lakes many other species of migratory wild fowl pause for a rest on their travels. Wild turkeys are relatively abundant. Of mammals, most of the native species survive, including the elusive timber or gray wolf, the bobcat, and probably the panther.

It would be pleasant to assume that in this remaining sanctuary the wild inhabitants and the age-old trees will go on living as they have always lived, but it is almost certain that, unless the tract comes under permanent state or federal control, their days are numbered. The lease to the state runs out in 1936, and local prophets are already predicting that before long the hunting fraternity will have left only a remnant of all the creatures of fur and feathers which for so long have made their homes near the banks and bayous of the Tensas. The fate of the giant trees may be slower if not less sure.

F. R. Dickinson

THE STARLING AS A CHINCH BUG DESTROYER

The starling has gradually worked its way westward until it has reached the plains states and has become exceedingly abundant in the Chicago area. In a few years' time, it will probably be the most numerous of all our birds. Great flocks assemble in the fall near the Academy's Trailside Museum in the forest preserve in River Forest; thousands upon thousands of birds gather each evening and roost in the trees along the Des Plaines River. It is natural that such an increase in an alien species should cause fears for our native birds. An interesting communication from Mr. Lawrence Graham of Cardington, Ohio, to Dr. V. O. Graham shows that the starlings are of some use to the farmer. In this issue of the Program Dr. Frison tells of the ravages of the chinch bug. Mr. Graham states that during the second week of July the chinch bugs were exceedingly bad, destroying thirty rows (about fifty shocks) of corn within one week after the wheat was cut. "Suddenly", Mr. Graham writes, "hundreds of starlings swooped down and in one day's time took practically every bug on that side of the field. The birds were only noticed here that one day. The rest of the field yielded about two bushels of corn per shock from there over the rest of the area. Neighbors say they have only noticed the starlings here in the last two or three years."

THE FIFTY-SECOND MEETING OF THE A. O. U.

The fifty-second meeting of the American Ornithologists' Union was held in Chicago from October 22 to 24, with many naturalists from all parts of the country present. Sixty papers were read on a wide range of subjects, but probably no topic created more discussion than that concerning the status of our wild fowl. Thursday morning was given over to papers dealing with game birds and conservation, and members of the Biological Survey reported on the surveys conducted by that Bureau during the past summer. It was the opinion of Cottam, Lincoln, and Preble that conditions are exceedingly grave, that many species of ducks are near the vanishing point, due to the destruction of their breeding places and to excessive shooting. Cottam and Preble showed that the number of breeding wild fowl was extremely low and that even in the far north, where breeding conditions were ideal, the marsh areas were occupied by only ten percent of the wild fowl which they could have supported. Such a report seems to indicate that excessive shooting and not lack of breeding areas has decreased the ducks which normally nest north of the limits of agriculture. Lincoln presented an interesting paper on the four natural highways on which wild fowl migrate, and he showed that wild fowl tend to follow along their ancestral highways, regardless of unfavorable conditions. Consequently, the building up of the breeding stock of ducks in reclaimed areas will be an extremely slow process, and the purchase and reclamation of a few thousand acres of marshland will have slight influence on saving wild fowl. In the discussions which followed the above paper, Taverner pointed out the futility of attempting to save the remnant of the flocks unless we first endeavor to control the shooting of the birds; and he stated we must eliminate excessive killing in order to save our breeding stock.

The annual banquet was held at the Stevens Hotel with Dr. W. H. Osgood presiding. He was ably supported by Drs. A. A. Allen, Alexander Wetmore, and W. L. McAtee.

Unusual motion films were shown Thursday afternoon, including pictures made by Rudyerd Boulton and J. F. Jennings under title "Birds of the Niger". Dr. A. A. Allen showed "Birds of Timberline and Tundra" from the region of Hudson Bay; C. P. Grant lectured on "Hatching Studies of Precocial Birds"; and A. M. Bailey gave three reels of "Florida Bird Life" which he and F. R. Dickinson secured on an Academy field trip this past-spring.

SEND IN COPY FOR AUDUBON ANNUAL BULLETIN

Members are urgently requested to write up their various experiences with birds, and to send them to the Academy for the next Annual Bulletin of the Illinois Audubon Society. We hope to publish it early in the year, so all copy must be in by the first week of January. Write up your notes now, and help make the 1935 number one of the best that we have issued!

Program of Activities
of
The Chicago Academy of Sciences

Vol. 6

April, 1935

No. 2

THE DUNES
of the
CHICAGO REGION

Dune Associations Flora Mammals
Reptiles and Amphibians
Invertebrates Archeology Birds

THE CHICAGO ACADEMY OF SCIENCES
Lincoln Park at Center Street
CHICAGO

ANNUAL MEETING

Mr. Tappan Gregory, honorary curator of mammals of the Academy, will give the annual address before the Academy on Monday, April 8, at 8:00 p.m. under the title

THE CAMERA'S CATCH

Mr. Gregory is one of the leading exponents of night photography. With set cameras he has photographed the denizens of the north woods, of western plains, and of wooded swamps of the southland. His talk will be illustrated with pictures of deer, bear, wolves, coyotes, and smaller animals. Both still pictures and motion films will be used. Members are requested to reserve this date and to bring their friends, that they may share with Mr. Gregory the trials, tribulations, and thrills of hunting at night with the flash camera.

FIELD WORK

Mr. E. A. McIlhenny, well-known southern conservationist, has recently donated to the Academy a group of blue geese collected on his land in Vermilion Parish, Louisiana, which will be installed in the Chicago Environs series. Blue geese were formerly abundant migrants through the Chicago Area, but at the present time only an occasional straggler visits our fast dwindling marshes. Although blue geese are extremely abundant in certain places, many experienced field naturalists have never seen them, owing to their limited distribution. They nest on remote islands from Hudson Bay northward, and winter on the Louisiana Gulf Coast. Mr. McIlhenny has extensive holdings in Vermilion Parish, Louisiana, the scene of several Academy field trips, and there are probably more blue geese on his land than upon that of any other individual. The birds are so numerous that they eat acres of the succulent "three-cornered" grass, and often times make large ponds by guzzling out the roots of the plants.

Field work in cooperation with the Natural History Survey of Illinois is being continued this season. Messrs. Bailey and Wright accompanied Dr. H. H. Ross of the Survey staff to Horseshoe Lake Sanctuary where motion films were made of the enormous flock of wintering Canadian geese. Specimens were secured in the vicinity for the large habitat group which will show a portion of the Calumet marshes as they appeared when the first settlers arrived. Mr. Luther Bourland, in charge of the sanctuary, aided the party by erecting blinds so that thousands of birds in his care could be photographed without being alarmed.

Mr. E. V. Komarek, Academy Mammalogist, has been given leave of absence to act as the assistant of Mr. Herbert L. Stoddard in conducting the work of the Co-operative Quail Study Association on Sherwood Plantation near Thomasville, Georgia. His brother, R. V. Komarek, who assisted in the field work in the Smoky Mountains, Georgia and Florida, is now on duty at the Academy.

THE SAND DUNES OF THE CHICAGO REGION

The Sand Dunes bordering the southern shores of Lake Michigan in northern Indiana have served naturalists as outdoor laboratories for many years. Unrivaled in the mid-west for varied plant and animal life, the windswept dunes, marshes and forests appeal to scientist and layman alike. In the early days, when transportation facilities were not the best, the region was comparatively isolated, so the wanderer who loved to tramp the Dunes and to be among wild things found little competition. The Dunes were his study and recreation. In 1921, the state of Indiana took over a part of the Dunes; the area became public property and a playground, the number of visitors increasing rapidly. Those who knew the unspoiled region of an earlier day cannot help but regret that "civilization" reached this region of beauty. There are a few areas, however, which are beyond the realm of the average picnic party. In the Great Marsh one may still find comparative solitude and be taken back to earlier days to wander, in memory, with the pioneer naturalists who have gone before us. It was inevitable, of course, that such an area, close to a large metropolitan district, should be taken over for recreation purposes; that summer cottages should line the shores where the waters of Lake Michigan roll upon the sands. Consequently, it is well to commend an organization like the Dunes Acre Corporation which is endeavoring to preserve the better part of its holdings in a natural state and have not resorted to exploitation as have many realty concerns. May it continue and save at least small parts of our Dunes!

Naturalists cannot find conditions as they were in days gone by—still the Dunes will prove a delight to outdoor people. The Academy has reopened the large Chicago Environs exhibit which portrays the shores of Lake Michigan with the Dunes rolling inland, the sandy wastes, and an area where the sands encroach upon marsh and forest. The group was planned many years ago by the late Frank M. Woodruff and a wonderful photographic background installed—so we have a record of the area as it was a quarter of a century ago. The work of rebuilding the exhibit has fallen into the capable hands of Earl G. Wright, and other members of the Academy staff. Although the group has been opened to the public, final installation of specimens will have to be delayed until the coming summer. The first section will show common sea gulls of that area resting back from the beach; the second will have a fine old bald eagle with a lake trout, being mobbed by crows; while the third, showing the marsh and woodland, will be used for the most part to show the common herons of the Chicago Region.

The following articles are not intended to give a complete account, or even to mention all the commoner phases of the subjects treated, for a complete Natural History of the Dunes would take several volumes. The several authors treat that which particularly interests them; their styles differ, for no attempt has been made to make a technical compilation of this matter. The authors were chosen because of their personal interest in the Dunes, and if they can interest *you*, the next time you visit the Dunes, in looking for things which were not before in your sphere, we will feel justified in having offered you this *Program*.

Dune Successions

By Verne O. Graham

Lake Michigan is a great reservoir of water into which great quantities of unassorted soil are eroded. The dashing waves carrying sand, and to a lesser extent gravel, build bars near the shore. By wave action and by the thrusting force of ice the sand is carried or pushed upon the beach. There, wind carries it along, eventually forming small dunes. These are bound by such grasses as the western and eastern sand-binders (*Calamovilfa* and *Ammophila*). Young cottonwoods germinate in the moist sand, and sand cherries also grow there and serve to stop the forward movement of the shifting sand. Higher and higher mounts the pile of sand. The cottonwood is buried deeply but the young shoots keep above the sand and send forth new roots to absorb moisture for additional growth. The tree serves to prevent the forward movement of much of the shifting sand and thus causes the dune to mount upward. At length as the beach builds outward by the accumulation of sands, newer dunes develop. The older dunes are sheltered from the winds by the newer ones. Bunch grass and some other low herbs serve as assistants to the sand binding grasses and the old dune becomes stationary. The wind blown seeds of pine germinate on the stabilized surface, and eventually a pine woods has developed.

The newer dunes are passing through a similar development in turn to be protected by yet newer ones and in turn to become stabilized.

The old pine area is eventually due for other changes. Birds and mammals carry acorns to the locality and the black oaks germinate beneath the pines. Eventually a mixed woods of pine and black oak occupies this area. Pine seeds will not germinate in this shade, so the pines grow to maturity and die, leaving the dune covered by a forest of black oak.

Beyond this point the story is somewhat more obscure, but red oak, hard maple, beech, and tulip trees can germinate in shade too deep for the germination of the black oak. Consequently these trees may eventually make up the forested area of the older dunes.

Should the process of dune formation continue in an orderly fashion without the development of destructive movements we might expect to see a widening beach with small dunes held by the sand binding grasses a hundred or more feet from the water line, the developing young dunes rising behind these, the older stabilized pine covered dunes in their rear, and yet farther back the black oak-pine mixed woods with black oak gradually gaining ascendancy, then the black oak covered dunes with red oak and hard maple replacing them especially in the ravines.

That dunes do not continue to develop in such an orderly manner is evident. Look at the shore line along the Indiana Dunes. In one place it has been eroded as far back as the black oak forest. In such a place the black oaks are on the dunes near the water front. At another point the erosion has reached into the pine covered area. Here pines are near the water front and black oaks are farther



COTTONWOODS ON THE SANDS

back. In other places the processes have alternated. Destruction has carried away the landscape into the black oak area, then re-construction followed as evidenced by the wide beach. Low dunes held by sand binding grasses have been formed and fresh sand is blowing upward against the oak covered dunes.

At another point erosion has swept away a protecting dune leaving a sweep for the wind through a wide ravine. Here the sand travels rapidly, and gradually buries the pines. Incapable of maintaining life partly buried, the pine forest becomes an area of dead trees. The oak forest in turn undergoes the burying process and fares but little better. The way is now wide open and a great advancing dune front moves upon the forest adjoining the swamp. Here occurs some of the most remarkable natural experiments conceivable. The red maples, white elms, ashes, sycamores, and lindens all have a veritable fight for their lives. Can they grow upward fast enough to keep the young branches above the piling sands? Fortunately for each of these trees they are able to send out roots from the young twigs. Again it is fortunate that young twigs arising near where new roots are being produced grow to much greater length than the remote twigs.

Covering the brow of the advancing dune appear a great number of bushes. Close examination reveals that a cluster of such bushes is in reality the top of one great tree already buried to a depth of seventy feet but still alive and apparently healthy as far as can be judged by the emergent shoots.

Last of all, reader, may I ask you, do you recognize some of the places already described? Doubtless you have viewed with awe and wonder the great



DUNE SANDS COVERING A FOREST

advancing dune located near the east end of the state park. Doubtless in spots here and there you have seen the pine covered areas. You may have wondered why so much of the region was covered with black oaks. These dunes are farther away from the danger zone of the washing waters than the pines, consequently a large percentage of their area remains.

That beech forests are not part of the situation in the State Park is difficult to explain. It is true that the western limit of beech forests is immediately east of this area. Even the tulip tree which belongs naturally in the climax forest with beech and hard maple finds its western limits in the dunes. Perhaps the same factors which limit its extension westward operate to prevent more than a scattering population here.

Of the climax trees the hard maple alone might be expected to form anything like a solid forest.

The position and shape of Lake Michigan is such that the prevailing winds cannot build high dunes on the west side of the Lake. Dunes become progressively higher from the south tip of the Lake eastward and northward into Michigan.

The low dune areas west of the Lake present a region of alternating ridges and wet swales. The number of flower species is very large because the types of habitat are so diverse.

The high dune areas to the south and east of the Lake have another added feature not so manifest among the low dunes. The south and southwest exposures become extremely hot beneath the direct rays of the sun. Here desert-tolerant



A TAMARACK BOG FROM A DISTANCE

plants can grow free from competition. On the other side of the same dune, shade conditions prevail. Near the base the air is nearly always cool and the flora is comparable to that of the far north.

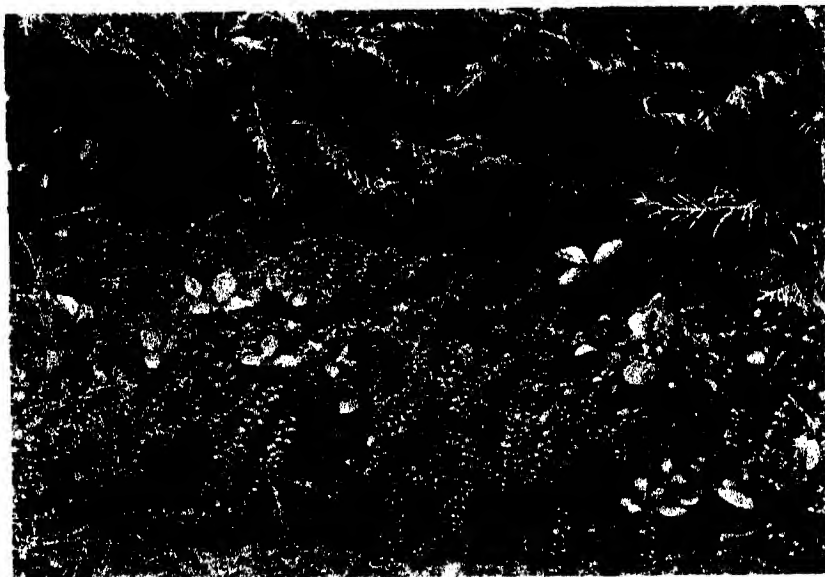
Landlocked by the approaching dunes, swamps have become bogs and with the change the flower list has become entirely different. Here grow lady slippers, pitcher plants, flax, forget-me-not, tamaracks, and last but not least the protector of all these flowers, the poison sumac.

Wild Flowers

By Verne O. Graham

The wild flowers of the dunes are remarkably beautiful. A trip through the area during May presents to the observer masses of blue and yellow, for then the great beds of lupine, the patches of bird's foot violet, and the yellow puccoon are in full bloom

Roughly the entire area may be divided into a number of flower habitats for the convenience of the wanderer in this paradise. These are: 1. the sun-exposed slopes and dry flats adjoining; 2. the shaded slopes; 3. the north face near a dune base, which is stabilized and well protected; 4. the rolling dunes, covered with black oak; 5. the area between dunes and swamps; 6. the swamps which are fen-covered, aspen-forested, or bogs; 7. the beach; 8. the low flats behind the first dunes but a little above water level of the lake (pannes).



NORTH EXPOSURE AT A DUNE BASE

On the dry sands during June may be found beds of prickly pear cactus with its large cream colored flowers, butterfly milkweed, with its flaming masses of orange flowers, and the flowering spurge with spangled white flowers. During May puccoon and sand cress occupy parts of the area. Other less known species are goats rue, rock rose, false dandelion, betony, sand phlox, red phlox, sandwort, and crest grass.

Columbine, wild geranium, solomon seals, and trilliums are common on the shaded, stabilized slopes. Here the forest is a mixture of black oak, red oak, basswood, choke and black cherry, and sassafras. In the undergrowth may be found sweet sumac, grape, bittersweet, and smilax.

In rare cases a north face has its base in a deep, well-protected cut. Such a habitat may contain plants of a more northern flora, such as arbor vitae, twin flower, and chimaphila.

The very old area made up of low, rolling landscape is covered with an almost pure stand of black oak with great patches of blueberries beneath. Huckleberry and New Jersey tea are associated with the blueberry.

The swampland bordering the dunes contains such interesting trees as black gum, red maple, ash, and an occasional sycamore. Between these and the great shifting dune front, which threatens its life is a forest of large white pines. The flora in this forest contains many unusual fungi, not to be found in any other part of the Chicago region. Among these may be mentioned *Leotia lubrica*, *Morchella conica*, *Gyromitra brunnea*, the white helvella, *Urnula craterium*, *Cortinarius semisan-guineus*, and *Polyporus schweinitzii*.



PITCHER PLANTS

The swamp itself presents three aspects: 1. the fen with its characteristic fen grass (*Calamagrostis*), cotton grass, and the late-fall gentians including fringed and soapwort gentians and sabatia; 2. a solid forest of aspen; and 3. the bog east of the State Park. Briefly it may be written that a bog may have been open water fringed with whorled loosestrife. This with sphagnum and other plants finally succeeded in carpeting the surface of the water.

The carpeting process began first as a fringe bordering the water. The great amount of loose soil surrounding the roots and submerged stems of the whorled loosestrife made it exceedingly buoyant. Water plants lodged upon it and land herbs invaded this new surface. Later bushes such as bog birch, and bog willow found this spongy, always wet, habitat favorable, finally tamaracks formed a dense growth of trees and the bog assumed the appearance of a forest.

On the beach the flora is limited by wave action. Only such plants as are able to make a quick growth survive. These are annuals and include sea rocket, creeping spurge, and beach pea.

Near the same level as the lake are pannes. Such well protected, low lying flats are always moist, and prove to be ideal seed beds for the germination of many different plants. Later these plants may be given an opportunity to show survival value while a mounting dune moves slowly over the panne. Several plants have proven their capacity to grow fast enough to keep their leafy branches above the sand.

Reptiles and Amphibians of the Dunes

By Walter L. Necker

Nowhere in all the Chicago Region can be found such a variety of reptile and amphibian life as in the dunes. Two species have been recorded from there alone in all the Chicago Environs—the pickerel frog (*Rana palustris*), which may be distinguished from the common leopard frog (*R. pipiens*) by its square spots and bright orange inner thighs, and the spotted turtle (*Clemmys guttata*), a pretty black turtle with bright yellow spots.

The wide beaches are usually devoid of reptiles, but large numbers of toads (*Bufo fowleri*) have been reported at the edge of the lake in early spring. Occasionally blue racers (*Coluber constrictor flaviventris*), hog-nosed snakes or spreading adders (*Heterodon contortrix*), and the six-lined race runner or swift (*Cnemidophorus sexlineatus*) are found on the first line of dunes, but they are usually farther inland, where there is more vegetation and cover between the stretches of sand.

On the oak and oak-pine covered dunes the above-mentioned are much more common, and are joined by DeKay's snake (*Storeria dekayi*) and the garter snake (*Thamnophis s. sirtalis*). The common box turtle (*Terrapene carolina*) occasionally enters this region from the moist woods which is its usual habitat.

In the more damp woods, the amphibians come into evidence in considerable number—to those who care to look for them. Underneath rotten logs two species of salamanders are frequently found—the red-backed salamander (*Plethodon cinereus*), which occurs in both the red-backed and a grey phase, and Jefferson's salamander (*Ambystoma jeffersonianum*), a dark brown species with faint white speckling. The tiger salamander (*A. tigrinum*) is also occasionally found in these rich woods. Most of the frog-species wander into these woods from the adjacent open water.

The water snake (*Natrix sipedon*) and its prey, the swamp tree frogs (*Pseudacris triseriatus*), cricket frogs (*Acris gryllus*), and leopard frogs are found wherever there is some open water. Common tree frogs (*Hyla versicolor*) are restricted to the cat-tails bordering ponds, while the green or cow frogs (*Rana clamitans*), the wood frog (*R. cantabrigensis*) and the (in the dunes) rare bull frog (*R. catesbeiana*) are in ponds, creeks, and ditches, associating with the spotted turtle and the painted turtle (*Chrysemys picta marginata*). The newt (*Triturus viridescens*) occurs in many of the ponds, especially in the western end of the dunes.

In the restricted areas of the tamarack swamps, and rarely in other parts, the masasauga or prairie rattler (*Sistrurus c. catenatus*), is still occasionally found. It is the only poisonous species of reptile found within seventy-five miles of Chicago.

Specimens from the dunes are still desired at the Academy since we have little data on the seasonal abundance of the majority of the species and no data at all on some forms, such as the opaque salamander (*Ambystoma opacum*) of which only one specimen is known. It was brought in by Tim Giddern from Wilson, in



DETAIL FROM THE DUNE GROUP

The bald eagle is now a rare bird, crows are still common in the dunes.

1932. Additional specimens of this black salamander with silvery cross-bands are much desired.

Many interesting problems are presented by the reptiles and amphibians of the dunes. Some may be worked on by the occasional, but regular, visitor. Others require rather permanent residence in the area. Among these may be mentioned observations on the apparent mass migration of frogs and toads along the beach (verification of identity of species by actual specimens is much needed), records of early and late appearance of the different forms each season, and the fascinating studies centering around the "banding" of toads, snakes, and turtles. The staff of the Academy is of course willing and prepared to suggest and assist such projects of biological inquiry in herpetology as well as in other fields.

Mammals of the Indiana Dunes

By Edwin V. Komarek

In the sand above the line of debris washed up by the waves, small five-toed tracks intrigued us and we followed them with considerable difficulty to an overturned and weathered stump. As we moved it, a pair of shiny bright eyes peered at us from a grass-lined nest, the home of a northern deer mouse, a mouse with bulging eyes, large papery ears, its body tawny above and whitish below and about half again as big as the common house mouse. A short distance away was a weaving trail made the past night by the "puss of the woods," the common skunk, who is known to everyone by his black and white striped coat and pungent odor, as he searched for some grub or unwary mouse. We followed his footprints to the first line of dunes where evidence of the night activities of the northern deer mouse was abundant.

Back of this line of dunes, sparsely covered with grasses, we came to a marshy swale in which there were small runways or trails, well packed and worn smooth, leading in all directions under the heavy growth of marsh grasses. In these runs we found small cuttings of green grass, the food remains of the common meadow mouse who had made and traveled these trails. After a diligent search we located a round nest, well woven of dry grasses with a small round hole as an entrance, upon the surface of the ground and covered over by soil and vegetation so that it was well hidden from prying eyes. As these mice feed during daylight hours, the occupant was not at home. If one is careful, patient, and a fortunate observer, one may sometimes see a tiny mammal, one of the smallest in the world, not much larger than a fair-sized grasshopper, gray in color, sharp pointed nose, and tail about as long as his body, following these runways. This is the common shrew. He feeds on various invertebrates and fears not to attack animals twice and more his size. One day we were fortunate in being able to observe one of these shrews hunting. He was very lively, at times scampering at random, sometimes traveling along meadow mouse trails, and poking his sharp pointed nose among the grasses. He suddenly found a grasshopper larger than he, but undaunted he pounced on it and in a very short time vanquished his foe and consumed nearly all of him. As soon as he finished his meal he started hunting again and disappeared from our view. As we walked about quietly, a cottontail rabbit startled us as he was disturbed from his "bedding ground" in the tall grasses and swiftly ran into the woods on the second line of dunes.

On these wooded sand hills a woodchuck spied us and scurried to his burrow in the sandy soil at the base of a large oak tree. A fox squirrel scolded us from a distance which he considered safe. These squirrels rarely show themselves or chatter at one in the woods near Chicago, for they have been hunted persistently and have learned to fear man. After a diligent search under a thick covering of leaves, we found tunnels and U-shaped runways in the soft soil, clean of any forest debris and well-worn. Later trapping proved them to be the work of the pine mouse once thought to be rare in the Chicago region but since found to be rather common in certain restricted areas. This rodent feeds upon the roots of the haw (*Crataegus*) and on the roots of many of the bulbous spring flowers such as the spring beauty. They build round nests of leaves and grasses with one or more entrances, usually in a depression in the ground or under a fallen tree or stump.

In such woods as these or in dry tamarack swamps one may sometimes see, on a cloudy day or at dusk, the flying squirrel volplaning from the top of one tree to the base of another or perhaps hurrying to the protection of his nest in some hollow tree or stub. In the footpath that we were following we noticed many long, raised ridges of loose earth, evidences of the presence of the prairie mole which is seldom seen because of subterranean habits. Farther along the trail tracks of the red fox who travels widely over the dunes in search of small mammals or other food were seen. Though of considerable size, as small mammals go, he has held his own in the dunes for he is a wary and cunning fellow, ready to

match his wits with his human neighbors for some such prize as a chicken. Nearby, in a hollow covered with pines, was once the home of the red squirrel or chickaree which at one time was very common in this region but is now rare.

In the tamarack swamp the tracks of the 'possum were common, showing where he had searched for anything edible. His diet is exceedingly varied. He, like the skunk, prowls about throughout the dunes.

Another hunter of the dunes, and a blood thirsty one too, is the northern weasel who preys on small rodents and frequently on some small unwary bird. There were several nests of leaves and twigs in the tops of the trees, the homes of the northern grey squirrel, the same species as those common in city parks.

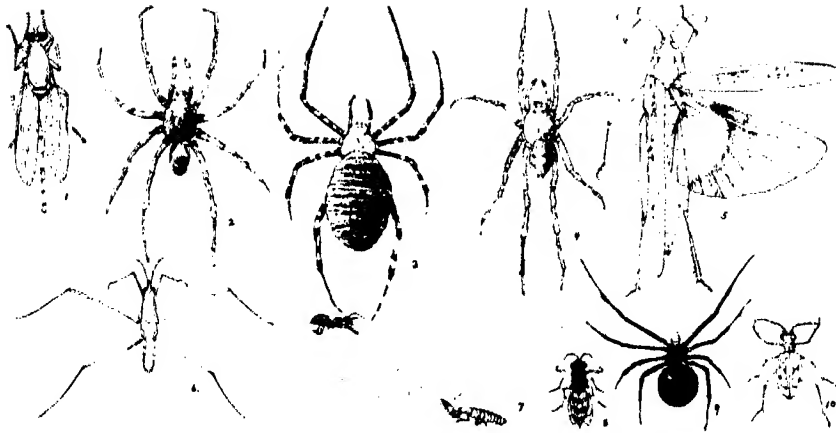
Along the little stream leading to the marsh small child-like hand prints were seen in the soft mud where a raccoon had passed by in the night. Because of his habit of washing his food he has been given the Latin name *Procyon lotor* and is always found near water. Though both he and the mink have fur coats that man desires, they have eluded him to such an extent that both are common in the dunes. Out in the marsh the large dome-shaped houses of marsh vegetation were found and frequently small platforms of tules and grasses showed where mink had been feeding recently.

As dusk approached and our day afield in the dunes came to an end we saw several bats flying overhead. They may have been any of several species which have been recorded from the Chicago region.

The Invertebrate Life of the Indiana Dunes

By Donald C. Lowrie

The first stage in the formation of the dunes is the beach. Here the animals are variably numerous. After a storm the beach will be covered by all manner of dead and living insects blown there by the wind and waves. At other times the regular permanent fauna is relatively scarce. Typically present are the sand spider, *Arctosa cinerea*, and the tiger beetles. Numerous ground and scavenger beetles hide under drift wood and feed on carrion. Various wasps and flies pass over the area, catching their prey or occasionally resting there. The tiger beetles, *Cicindela lepida* and *cuprascens*, are quite plentiful on the hot summer days. Throughout the dunes successions other species are also present, but restricted to specific associations. On the beach these small beetles, which are the most rapid flyers of the order, being equal to flies and hymenoptera in this respect, will arise and fly a short distance, often alighting facing the collector as though to watch for his next move. They can only be caught by a slow stalk and then a rapid down-sweep of the net, pinning them to the ground. This stalking procedure as observed by an outsider, makes the amateur naturalist appear as a likely candidate for an asylum, but it is quite an effective means of catching this interesting insect. The larva is a peculiar creature with an enlarged head of a metallic bronze color and a



1. Robber fly, fore and poplar dune; 2. Sand spider, beach; 3. Garden spider, oak and swamp margins;
4. Sand-burrowing spider, fore, poplar dune and blowouts; 5. Sand grasshopper, fore and
poplar dune; 6. Water-strider, ponds; 7. Ant-lion larva, black oak; 8. Sand wasp,
fore, poplar and blowouts; 9. Black-widow spider, oak; 10. Sand tiger beetle, beach.

pair of gigantic jaws. The rest of its body is white and worm-like except for a hooked structure in the middle of its back which is used to anchor it in the burrow. These larvae with their various moisture requirements are responsible for the specific distribution of the beetles.

As the sand brought up by the waves and blown by the wind is piled up by grass and other objects in its path, the fore dunes and poplar dunes are formed. Here are more of the wasps and flies, finding shelter on the bushes and cottonwoods. Some of the more characteristic animals are the sand-digging wasps, sand grasshoppers, robber flies, and various spiders, especially the burrowing wolf spider, as well as certain tiger beetles and various smaller insects which are not so apparent. *Geolycosa arenicola*, the sand burrowing spider, and *Microbembex monodonta*, the digging wasp, are as numerous and interesting as any of the animals found. The spider starts life as a miniature of its mother, going where she goes with its brothers and sisters on her back. After the first molt, the young spiderling begins life by itself in a tube, which it builds proportionate to its size. With each succeeding molt the tube is made larger till the adult hole is half an inch in diameter and eighteen to twenty inches deep. These burrows are used during the day, but at night the spider-forages abroad for possible prey which is captured by stalking, instead of using some kind of a snare or web as many spiders do. Also characteristic of the fore dune and poplar dune, as well as blowouts and open sand banks farther inland, is the Bembicid digging wasp. The habits of a similar wasp are described by Fabre in his book "The Life of the Hunting Wasp." This small, black and yellowish-green, striped wasp digs a burrow through the loose dry sand to the damp, more solid, underlying sand, where it forms a chamber and lays an egg on a paralyzed fly. After the egg hatches and the larva begins to feed, the mother brings freshly killed flies every day or so. The larval chamber is solid-

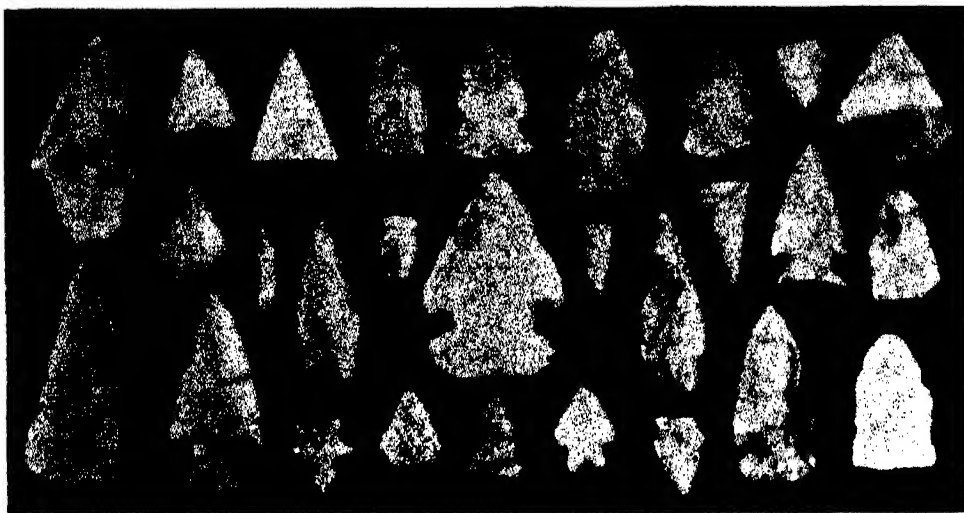
walled, but the entrance is through the loose surface sand so that as the wasp forces an entrance, it automatically closes behind her. On any warm sunny afternoon, these wasps may be seen hovering over the sand, cooling off or digging rapidly out of sight into the larval chamber.

In the pine dunes, the abundance of life is markedly increased due to the increase of shelter afforded by the trees and undergrowth. One of the richest habitat niches is that of the decaying logs. First, come the looseners of the bark, such as the pyrochroid beetle larvae and various adult snout beetles. Later, as the heart wood decays, adults and larvae of *Passalus cornutus*, and colonies of termites will be found. Cockroaches, earthworms, slugs, millipedes, centipedes, sowbugs, snails, ants, and various spiders are numerous in the final stages of decay. During the winter many cold, inactive hibernating bees, wasps, flies, and beetles fill the empty larval burrows. The logs of the pine association, as well as later ones, harbor colonies of the termite. This small, usually tropical animal is of interest because of its highly complex social organization, and because it reaches the northern limit of its range in this region. The bronze tiger beetle, *Cicindela scutellarius lecontei*, is a characteristic pine dune form. The spider fauna is noticeably increased by the many species of web builders that find shelter on the trees and bushes.

Following the pine association is the black oak, which is the last characteristic dunes association. Doubtless the most typical animal here is the ant-lion larva. This small insect builds a perfectly shaped depression in the loose sand. Many of the bare sandy areas are literally covered with these pits. The larva lies buried at the bottom with its jaws wide open to grab an unlucky insect which may fall into the pit. After the prey is sucked dry, the remains are flipped out by a quick backward and upward movement of the larva's head.

Also found in the wooded oak association is the relatively poisonous black-widow spider. This deadly female is of a shiny black color with a red-spotted globular abdomen. She builds her web of many intersecting lines on a small bush, forming a large three-dimensional structure a foot or two above the ground. At the base of the web is the retreat or nest, which is a hollowed-out space among the leaves and forest floor debris. In the web she is a dangerous lady, but out of her web she is rather harmless and can only be forced to bite by the most intensive teasing. A finger or elbow or the like thrust into the web may be bitten almost immediately. Therefore one need scarcely fear the widow at all as a web can be seen and so easily avoided.

The last areas of interest in the dunes are the various marshes and ponds. In the water may be found the diving spider, *Dolomedes sexpunctatus*, the larvae damsel-flies and dragon-flies, as well as numerous crustacea, adult scavenger, diving, and whirligig beetles, water bugs, backswimmers, and wiggling mosquito larvae. By the shores of the ponds, the beautiful black and yellow garden spider, *Argiope trifasciata*, builds its perfectly symmetrical web. Fly-catching damsel-flies and dragon-flies skim over the surface of the water.



Indian Artifacts from the Dunes

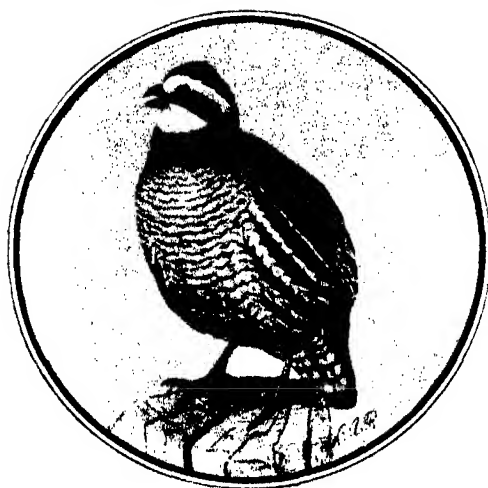
by Norman Bergendahl

In the spring of 1928, I found my first arrowhead at the Dunes. Prior to that time I, like most people, trod over evidence of Indian occupation without seeing it. Since finding that arrowhead I have been appreciative of the possibilities of this area as a collecting ground and seldom make a visit without bringing home at least one specimen.

The following localities have been especially good collecting grounds: ridges along the Grand and Little Calumet Rivers; ridge immediately south of Dunes Highway; ridges north of the Great Swamp from Wilson eastward; and the larger blow-outs in the Dunes State Park. Specimens that I have found consist of fragments of pottery, arrowheads, spearheads, scrapers, hand hammerstones, and drills, in the order of their abundance.

Pottery found in this area is very fragmentary and is made of clay that has been tempered with sand and crushed rock that contains large amounts of black crushed rock. The general color of pottery is usually buff or brick-red; the decorative designs are very diversified. The outside design of most common occurrence is the twig brush design made by passing a brush of twigs over the surface. An unusual design found along the Little Calumet River, has a zig-zag pattern from the impression of a plant stem that resembles *Equisetum* (Horsetail). The rim edge designs on most specimens are plain. Few specimens have a design on the inside surface. The only inside patterns found consist of vertical incised grooves.

All arrowheads that have come to my attention are made of flint or chert. They vary considerably in shape, finish and thickness. Arrowheads with fastening ends are less uniform in design and are quite thick. They may be classified with reference to fastening ends as stemmed, barbed, and bifurcated or indented. Triangular and other forms are about equally common.



NOTES FROM
The Illinois Audubon Society
(Section of Popular Ornithology of the Chicago Academy of Sciences)

Reminiscences of Birds of the Dune Country

By Edward R. Ford

Many of you who read this have been my companions in the Dune country—that delightful region which is so rich in the variety of its natural forms and so lovely in its aspects at all seasons. And perhaps you, as one who has shared adventure and high emprise (albeit ours was simple enough), interrupting me with approving “yeas” and “verilys”, will relive a time when the Dunes yet retained some part of their original uncultivated detachment.

It was February and zero weather, but in a pine-thick hollow there was a great snow-rimmed nest where, long before the huge owl flew, we knew to be what we sought—a great horned owl. Again that day, in a hole in a veteran oak, we could just see the ears of another owl. Some dim influences of the far-off beginnings of our race is felt in the shrieking winds of a winter day and in the presence

of feral folk who must kill or starve and, killing or starving, must front the killing cold. We, too, are moved by vicarious, fierce delight in the warfare of the elements and the beasts. I wonder if we should be if food and shelter were not close at hand.

Now, through a blow-out, we reach the arctic beach. Blue water is far out but long lines of mergansers and golden-eyes, wind-driven, pass and repass, seeking open water among the near-shore floes. A sudden snow-squall blinds us and we stumble on a goose, blind as ourselves. It beats into the air, the roar of its wings unheard because of the roar of the wind. In the dim light of the storm it looks like a man's empty jacket taking flight.

The squall is over but the grey skies still threaten and winter's early twilight, darkling comes. There is just overhead, in the narrow swale which we cross on our way back to the station, a little rush of wings and a light chorus of sibilant notes. Bohemian waxwings! Again the stir of the pulses—not that we have seen a beautiful and unfamiliar bird, but that, among all the chances of their intrepid wanderings and of our own uncertain and devious ways, this conjunction has occurred.

And now with spring once more upon the land, the grouse beats up his drum and the piping plover scurries along the beach until he is lost to the eye in the sand which his color matches. In an opening, reached by following up the creek from the beach, we flush a woodcock and, in a place of sun and shade, a scattered growth of stunted pines, a whip-poor-will is started from the ground. As if all this were not enough, our homeward haste is halted by a group of clay-colored sparrows, and again, by the casual movement in the pines of an Arctic three-toed woodpecker, apparently aware but certainly not disturbed as we watch his deliberate gleaning.

There was here, we thought, material for the sort of search which is ever a delight and the sort of discovery which, though not altogether unexpected, is ever a surprise. And so, another day which followed soon was to discover for us two breeding grouse. (Are there any left in the Dunes?) One was found, as you may remember, when a jocund comrade made an exaggerated gesture, swept his hat from his head in the direction of a thick fallen branch, and exclaimed, "There is my idea of a place where a grouse should nest!" Sure enough, the grouse, unable to contend with such an exhibition of psychic power, abandoned her post and disclosed her eggs—a baker's dozen. Forces more material were employed to find the other. A search of "likely" places along a ridge, regularly and for some time frequented by a drumming grouse, at length revealed the nesting bird, hidden by the green spray of a fallen pine bough.

On the beach, or rather back of it—man had made, by carting away the great sand hillocks, a wide, flat, sandy waste. He had no thought, of course, of the benefits that would accrue to the piping plover, thus provided with a wide area instead of a narrow strip of shore on which to fashion the little hollow which served it for a nest. One is aware of the bird running ahead; one retreats and re-

mains motionless, watching. "He isn't interested," says the plover, after running off some distance as if expecting pursuit. "Quite safe now, I think, to go back and attend to business." Safe enough, perhaps, but not enough to escape being photographed to fragments a week or two hence, when eggs are near to hatching and solicitude cancels fear.

The woodcock employs the tactics of masterful inactivity. Observation of the "signs" or chalkings, the flushing of the male and then a sharp scrutiny of the area, with respect to the known quantities—plants, leaf deposits, counter-shading, stalks, sticks, or fallen branches—and there's your lady woodcock on the nest. Simple as that!

Unlike the woodcock, the whip-poor-will, equally as well concealed when on the ground, will leave her eggs when one is a dozen feet away. She leaves them on silent wings and if she happens to do so when one's back is turned they may escape detection. But in the Dunes, as elsewhere, if one finds in May a hollow or hillside where *two* birds are seen, a later search is likely to result in raising the nesting bird. But a whip-poor-will's nest may be a long way from the haunts from which his night calls come.

No doubt in early days the flats and marshes, which stretch away to the south from the sand hills, were the scene of the storied dance of the sandhill crane. Here no longer is there solitude enough, and it is a rare thing to see even one sojourner of this species in the Dune Country. But once we saw a lone bird there, rising from behind a screen of willows, stretching his long neck and legs and losing himself beyond an oak ridge. Sighted briefly, he seemed a phantom crane, come to revisit the old domain where once his tribe flourished and lived the life abundant.

Each Dune encounter has a separate flavor, and the subtle essences of which each is compounded are largely of the spirit. A sense of melancholy is our response to the lonely cry of a willet on the beach. The bird, rarely seen here, is alone and calls despairingly, as one utterly lost. Or we are exalted by the beauty of the swift, small hummingbirds of whose nests we have found half a score in one day—tiny fabrics, well-nigh imponderable, but, for their purpose, magically strong. The spell of summer now lies upon the spirit and enables us to feel an exaggerated significance, perhaps, in the Acadian flycatcher's choice of a green dim aisle for its home, in the black-and-white warbler's restless flitting and high, thin song, or in the furtiveness of the chat, strangely and sharply succeeding his springtime mimicry. Again we watch the tireless journeyings of the fragile, disjointed blue-gray gnat-catcher as he carries materials for his nest, and behold him, a master craftsman, at work.

These Dunes of ours know the birds of the four winds. Out of the North in winter the redpolls and crossbills drive; from the East soar with summer the prairie warbler and the Acadian flycatcher; up from the South on wings of leisure drift the Bewick's wren and titmouse; from the broad West, flying far, come the willet and the Henslow's sparrow.

We have found the nest of the Henslow's sparrow in the Dunes but once; hunting for it, we found something else. It did not seem unfriendly—that warning buzz. To be fair we should have buzzed too. But, instead, we pounced upon the massasauga and put him in a bag. It happened that one of us had long wanted a specimen of this particular sort. It made him happy to get it. And so the serpent in Eden detracted not one whit from its joy. But when were we not joyous in the Dunes?

Suggested Bibliography for Further Reading

Bailey, E. Stillman The Sand Dunes of Indiana

Chicago: A. C. McClurg & Co., 165 pages, 1917

A description of the Sand Dunes, profusely illustrated with excellent photographs by the author.

Brennan, George A. The Wonders of the Dunes

Indianapolis: The Bobbs-Merrill Company, 326 pages, 1923

An interesting story, mostly dealing with the history of the Dunes from prehistoric time to the present. Several chapters are given to Natural History, but accuracy of many statements is questionable.

Downing, Elliot Rowland A Naturalist in the Great Lakes Region

Chicago: University of Chicago Press, 336 pages, 1922

The best general account of the natural history of the Dunes. Geology, Botany, and Zoology are treated in considerable detail, for the small size of the book. Very interesting and informative reading.

Peattie, Donald Culross Flora of the Indiana Dunes

Chicago: Field Museum of Natural History, 432 pages, 1930

An annotated list of the flowering plants and ferns of the Dunes, including keys.

Pepoon, H. S. An annotated flora of the Chicago area.

Chicago: Chicago Academy of Sciences, 554 pages, 1927

An annotated list of the plants of the Chicago region, with a discussion of various floral regions within the area including over thirty pages on the Dunes.

Shelford, Victor E. Animals Communities in Temperate America as illustrated in the Chicago Region.

Chicago: University of Chicago Press, 362 pages, 1913

A study in animal ecology of this region, with a considerable amount of information on the animal life of the Dunes.

The Academy will have the above-mentioned books, as well as other articles on the Sand Dunes, especially available to its members in the Children's Library during the next two months. Questions on other phases of the Dunes will gladly be answered by the staff, and more technical references given.

Program of Activities
of
The Chicago Academy of Sciences

Vol. 6

July, 1935

No. 3

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THE
BLACK WOLF
OF THE
TENSAS

BY
TAPPAN GREGORY

• •

THE CHICAGO ACADEMY OF SCIENCES
Lincoln Park at Center Street
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THE ANNUAL MEETING

The Seventy-eighth Annual Meeting of the Chicago Academy of Sciences was held on April eighth, 1935, with a record attendance. The following officers were unanimously elected: Francis R. Dickinson, President; Dr. Edmund Andrews, First Vice-President; Dr. Fay-Cooper Cole, Second Vice-President; Dr. Nathan S. Davis, III, Secretary; Austin J. Lindstrom, Trustee for six years; and Orpheus M. Schantz and C. Blair Coursen, Scientific Governors for three years. Tappan Gregory, Honorary Curator of Mammals, presented the Annual Address, entitled "The Camera's Catch," telling many of his fascinating experiences in making flash-light photographs of animals. This number of the *Program* is devoted to some of these experiences in northern Louisiana last fall.

THE BLACK WOLF OF THE TENSAS

Wolfing with the Camera

By Tappan Gregory

Honorary Curator of Mammals

FOREWORD

To hunt in strange, new country, whether with cameras or otherwise, with any hope of success, is out of the question without cordial cooperation from those on the ground, familiar with the territory. To speak of cordial cooperation in connection with the field trip to northern Louisiana in the fall of 1934, undertaken in the interests of the Chicago Academy of Sciences and the U. S. Bureau of Biological Survey, described in the following pages, is a gross understatement. We could not possibly express our appreciation of the friendliness and interest and tangible helpfulness of all our good friends in Tallulah. Their numerous visits to our camp, to make us feel at home and to do everything conceivable for our comfort and welfare, were indeed very bright spots. All of them were cordiality and kindness itself.

To those who made the visit to the Singer Wild Life Refuge possible, we are particularly indebted. To the Honorable Henry C. Sevier, counsel for the company, for arranging the necessary permit from his client; to the Honorable Robert Maestri, head of the Louisiana Department of Conservation, for permission to work on the wild life refuge; to his able and efficient lieutenant, J. J. Kuhn, agent for the Department, for invaluable assistance made possible by his extraordinary knowledge of the country; to E. P. Corkran, warden of the Singer Wild Life Refuge, for his generous permission to use his camp during our stay; and to V. W. F. Jefferson, also warden of the Singer Wild Life Refuge, for his thoughtfulness throughout our visit, we are most grateful and here take pleasure in expressing our sincere appreciation of what they did, and our warmest thanks.

One name I have not yet mentioned because it is difficult for me to express how much his presence meant to the success of our venture. Without Stanley Young there would have been no expedition. More than anyone else he was responsible for our success. It was his idea, organized by him, made possible by his intelligent administration and indomitable spirit. And his cheerful, efficient presence as one of the party was in itself one of the most satisfactory and pleasant features of the trip. He would have joined me in writing this article except that I could not permit him to foreclose me from what I wanted to say about him and he was altogether too modest to permit his name to appear as a co-author. I am more grateful for his loyal and unselfish cooperation in the whole enterprise, including the preparation of this paper, than I can possibly say.

Chicago, February 15, 1935.

I.

Sundown. The lake lay quiet in the shadow of the Tobacco Mountains, its surface smoothness broken only by the ever widening circles made by rising trout. This was the hour for activity around the big fireplace inside the ranch house. As usual we had made a long day of it, riding the benches and enjoying incomparable fishing on the glorious old Madison. Now the horses had been unsaddled and turned out, the tackle stowed away and supper was eagerly awaited. With all of us collected indoors, the old ranch house seemed barely adequate for our needs. But the ever generous West is a source of constant happy surprise in the elasticity of its hospitality.

A car rolls up to the back door with a load of fine, upstanding men from the United States Bureau of Biological Survey. Their hearty inquiry, "Can you make room for us for one night?" is met, as might be expected, with the ready response, "Well, I guess we will have to, wont we?" Here is the Chief of the Bureau with four of his ablest assistants. They are touring across the Northwestern States inspecting the work of their staff and now it is Montana's turn. Among them is Stanley P. Young, at that time, in September of 1929, in charge of the Division of Predatory Animal and Rodent Control. He inspires confidence at once—clear eyed, forceful, intensely loyal and earnest of purpose, lightening it all with ready wit. Happily, their stay was not limited to that first night. The trout were too alluring during the daylight hours and the horse-shoe pitching in the evening too closely contested. So we enjoyed these congenial companions for several days.

Fishing did not interest Young quite as keenly as it did some of the others. This gave us the excuse to show him our set-cameras. We had been devoting much of our time to placing cameras in such a way that wild animals might come, spring them themselves and take their own pictures. His lively imagination and keen perception showed him the broad range of possibilities in this method of hunting and his interest seemed at once aroused. Many good discussions followed and numerous trips to the various localities where we were trying so hard to inveigle a coyote into our set.

We could not talk to him of our early ambitions without coming soon to the subject of the Timber Wolf. Turning back twenty-five years, the recollections of first impressions in the wilderness were still vivid. We had ever hoped that the next turn of the trail might bring one of these grizzled hunters into view. Nothing stirred us in those days more than to sit in a darkened theatre and listen to some past master close a thrilling lecture on wild animals with a delightful imitation of the howl of a Timber Wolf. It left us wishing that we might hear that stirring sound some day, sent forth by a real wolf. Many years passed before realization of this wish, but when it came it surpassed anticipation. Always we had thought of the Timber Wolf as possessed of the most courage, the most cunning, the most stamina and, to those of his kind, perhaps the greatest loyalty of any of the wild beasts inhabiting North America. From the time when we first began to photograph wild animals, the ambi-



OUR CABIN WAS IN A PICTURESQUE SETTING

tion to take pictures of this grand old reprobate and the thought that if we could do this it would be as great an accomplishment as could be achieved in our favorite avocation, were ever present. All this fell upon sympathetic ears. Stanley Young, an accomplished and experienced wolf hunter himself, understood and appreciated our admiration for this much maligned predator. Many times we spoke of the possibility of some day collaborating in seeking this victory.

That first short session together led to many other pleasant visits when we found ourselves within reach of each other. And invariably before we parted, we talked again of nebulous plans for the wolf hunt with the cameras.

At length the time came when Young spoke substantially this way: "It is all very well to talk of doing this some day, but if we do not set a definite time, we shall never get it done." This was in June of 1933, and after a brief discussion we agreed that October of 1934 should see us together in the field, armed with a battery of cameras, ready for the great experiment.

II.

It would seem that sixteen months was time enough to have everything in perfect order, yet we found when we came to load our cars for the start that there were still a few tag ends. The work of preparation was in a general way divided into two sections. Young mobilized his forces and directed the campaign to find the wolves,—

not a very unimportant contribution! We were fortunate in attracting the interest of Robert S. Sturgis, and persuaded him to join the expedition. It was largely through his mechanical and electrical genius that we found it possible to design and construct the apparatus so necessary to any measure of success. Obviously, we must first locate some section of the country where wolves could be found in substantial numbers, and equally obviously, we could not hope to obtain pictures were we to set out only one or two cameras, because wolves travel so much and frequent so many choice spots that though they were all about us, we might wait indefinitely for a visit unless we could have our equipment well scattered throughout their range. This consideration dictated our decision that we must have available at least ten cameras.

The basic principle of the set-camera is about like this: It is fundamental that a complete electric circuit carries current throughout its extent and may have hooked on to it any number of devices to be actuated by this current. It is equally axiomatic that if this circuit's continuity be broken at any point, no current will flow. We find that two dry cells of the size normally used in an ordinary electric torch will give us all the electric power needed. With these cells we construct our electric circuit and then break it. In the break we interpose two contacts called the "trip," constructed in such a way that they will be brought together by any animal exerting pressure upon these contacts.

There are several ways of accomplishing this. The ordinary method is to set into the ground two narrow strips of metal of high conductivity, separated from each other by perhaps a sixteenth or eighth of an inch and to lead from the taller of these two bands a fine wire. We call this our "trip wire." It is so fine as to be almost invisible and very easy to break. The other end of this wire is anchored down and it is led across the trail where the animals are expected to travel. When one of them strikes it, he will pull the two bands together and thus complete our circuit. The trip may also be arranged with a bait wired to it.

In hunting Timber Wolves, however, we felt that their keenness and wisdom in the ways of man made it necessary to employ a means, if possible, that would leave nothing above the ground for them to smell or see. It did not take Sturgis long to perfect a buried tread consisting of two metal plates kept apart by insulated springs with the lower plate carrying a series of sharp-pointed nails leading up towards the upper plate. Many conferences were held and many experiments made, to determine the right size of the plates, the character of the nails, the pressure which we should require for the making of contact between the upper plate and the nails, the size of the canvas cover to be laid across the top of this plate, and various other related questions. Sturgis and Young spent many hours together working over this problem and their joint efforts resulted in the tread finally used. It was one foot square and the pressure required to bring plate and nails together was regulated by the tension of the springs and the gap between upper plate and nails. Eventually, Sturgis made up some sample treads and one of these was buried in a nearby patch of woods and allowed to remain there several weeks.

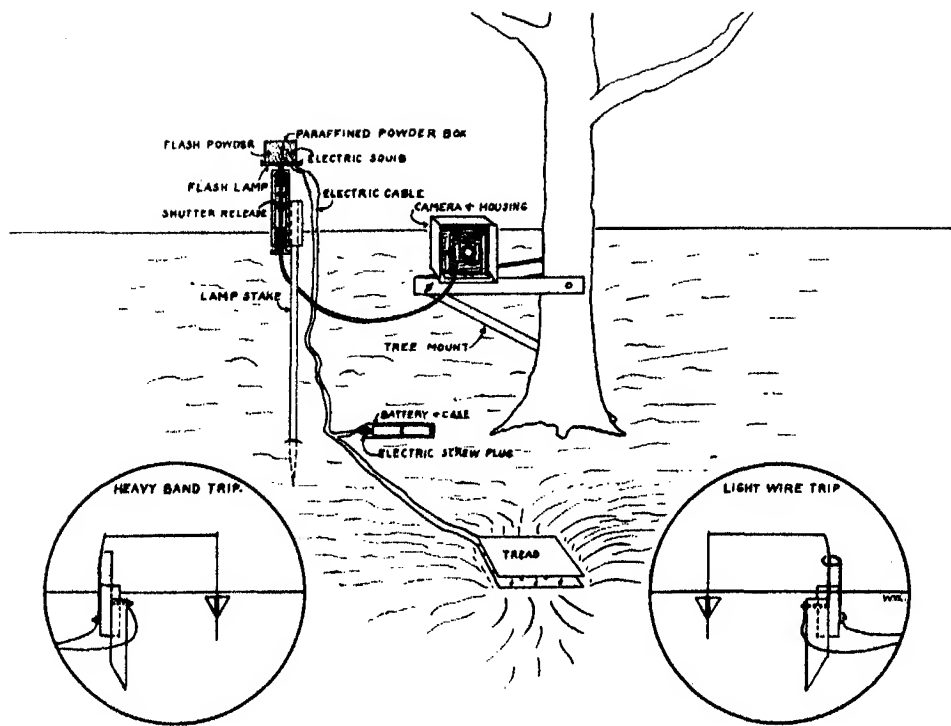


DIAGRAM SHOWING EQUIPMENT IN PLACE FOR MAKING FLASHLIGHT PHOTOGRAPHS

It is only by actual experiment in the field that idiosyncrasies in the apparatus may be discovered and faults corrected. Every care was used in the construction of these treads and we imagined that every possibility had been canvassed and could find no reason why this piece of apparatus should not work perfectly. Yet, after several experimental shots at the end of a month or six weeks, two fundamental difficulties had developed. The gathering of moisture underground so corroded our top plate that the first type of nails used did not make sure and positive contact through this corrosion. Silver plating of the nails and the top plate corrected this fault. Also the type of nails had to be changed to give us a sturdier and more lasting point. This is cited merely as an example of some of the many difficulties encountered in trying to perfect our apparatus.

But to return to the principles of the set-camera. The conductor for our electric circuit consists of two eighteen-foot lengths of manifold-strand copper wire, well insulated from each other but bound together in a casing of heavy rubber. Their ends are separated. One leads to one terminal of a socket into which is screwed a water-proof case holding the dry cells. The other is extended for an additional five feet to connect with one of the two lead wires of our fuse or photographic squib.

From the other lead wire another five foot length is taken back to the other terminal of the socket. These two five foot wires are also encased as a "twin pair" in heavy rubber insulation.

The fuse is made up into a capsule of hard wax covering a very fine fuse wire of about one-eighth inch length buried in a pinch of gunpowder. The resistance of the fuse wire is so high that with the passing of the current from the dry cells it breaks in two with a spark, igniting the gunpowder and causing a small spurt of flame. We bury the fuse in two-thirds of an ounce of magnesium flash powder contained in a cardboard pill-box. When the circuit is closed the fuse burns at once and fires the flash instantly. The resultant brilliant flare of white light gives us a fully exposed negative on the darkest night. We must have this, for most of the wild animals can best be photographed in their natural state at night.

The flash also serves another purpose. It is quite explosive, especially when the pill-box is sealed with paraffine to keep out moisture. We utilize this explosive energy to trip our shutter. The rack holding our pill-box is mounted on a plunger traveling in a cylinder at the bottom of which is socketed the button of a long, pull-type cable-release in heavy casing. The other end of the cable-casing is fastened to the camera bed and the cable itself wired to the shutter arm and the shutter set at 1/200 second. The explosion of the flash drives the plunger onto the button of the cable release, operates this release, pulls down the shutter arm and thus trips the shutter in the middle of the flash. The contraption containing rack and plunger we call our "flash lamp," and the combination of long, rubber-insulated wire, socket, and battery case we know as the "harness."

We may now trace the path of our electric current somewhat as follows: From positive pole of battery through one long wire of harness to trip; through two elements of trip, when closed, back through the other long wire of harness and one five foot length to one lead wire of fuse; through fuse wire, back down the other lead wire of fuse and the other five foot length of wire in harness to negative pole of battery.

Of course, if the set is sprung in daylight bright enough to give us a well-exposed negative, the value of the flash for lighting purposes is negligible. It does, however, supplement the dim light of dusk or early dawn to give us a good exposure. In any event, the explosion of the flash always furnishes the necessary energy to trip the shutter and take a picture whenever the break in the electric circuit is closed and the circuit completed by the bringing together of the two elements of trip or tread.

Perhaps the most troublesome single feature of the whole arrangement is the flash itself. In explosive and light-giving qualities, no two charges of flash powder are the same. Moreover, when the powder becomes damp and cakes up or when it is closely confined, it explodes with a tremendous roar and great concussion. This is a severe strain on the lamp and sometimes jars the camera enough, just as the shutter trips, for the resulting picture to exhibit the devastating and ruinous double lines of vibration.

The camera, of course, has to be protected from the weather. To accomplish this we constructed metal housings. Each housing was made in two sections. The bottom, or bed, of the housing is separate from the box-like top piece. This piece was constructed with open front and bottom so that when the bed and camera were screwed in place on tripod or tree-mount it could be fitted down over and fastened in place with wing-nuts.

For the ordinary run of wild animals, the camera is almost invariably placed on a tripod. We thought it might improve our chances of success with the Timber Wolves, however, to eliminate the legs of the tripod as a possible disturbing influence and place our cameras in trees. Again Sturgis' ingenuity was called into play, and a very sturdy bracket prepared. The placing of the cameras on trees limited our freedom of action somewhat because it was always necessary to find a tree not too small and not too close to or far away from the point at which we intended to bury our tread. Not being sure what we might expect to find in the way of available trees, we constructed tripods as well as tree-mounts for all the cameras.

To complete our equipment, except for a number of small articles to be collected, such as testing lights, lens caps, pounding caps, wrenches and other small tools, magnifying glasses with which to focus, and similar items, we made a six-foot stake for each flash lamp. We thought that the results of our experiments would justify us in tying the lamp to the same tree that carried the camera wherever it was of at least one foot diameter, but included the stakes to be on the safe side. To make all this apparatus, try it out, discover its frailties and accomplish necessary changes and corrections was an exacting and time-consuming task, especially in view of the fact that it must be done largely during the evening and in such other spare hours as could be found.

Now we are ready to place a hypothetical set: Perhaps it will be made with a trip-wire across a game trail. A likely spot is selected with particular reference to the surrounding terrain. We do not know from which direction our subject will approach. There are fresh tracks of deer on the trail but no sign of larger mammals. We estimate the length of a good-sized buck, assume that he may come from either direction and tentatively choose the position for the camera. No tree, bush, tall weeds or high grass can be tolerated between the lens and that part of the trail within the limits of our field. The trip-wire will be in the center of the picture and the field must extend far enough to right and left to cover the length of the imaginary buck as he walks along. The distance of camera from trail determines this.

While the camera is being set up on its tripod and the lamp put in place on its stake by one of us, the other is busy attaching the ends of the long wires of the harness to the binding posts on a block of wood holding the trip. This block is buried far enough in the ground to leave only the elements of the trip above the surface. A trip-wire is attached, stretched tight across the trail at suitable height and securely anchored on the other side. Burial of the harness wire clear back to the camera comes next.

By this time, the man at the camera is ready to focus. We find the filament of a lighted electric bulb a good object upon which to focus. This is one of the most important and most exacting of all the operations. It is our unalterable practice to use a magnifying glass against the ground glass of the camera to insure as nearly as humanly possible that our point of exact focus will be in the center of our field and not either at the far or near edge as might well be the case if we relied on the naked eye.

Our circuit must now be carefully tested. The best way to make the test is to place a small electric light bulb in the circuit in lieu of the flash and screw the battery in place. If there is no short circuit, the light will not burn until the bands of the trip are touched together. Then it should flash brightly.

With camera focused, trip-wire in place and circuit in order, remaining operations are quickly accomplished. The lens is capped, plate inserted, slide removed, top of housing fitted in place, and shutter tried out by manual operation of lamp for proper synchronization. Making sure that the battery has been taken out of the circuit, we wire on the charge of flash powder, cock the shutter and remove the lens cap.

Only one step more remains. We look the situation over carefully, check what we have done, pick up, pack away, and move to a safe distance all tools and pieces of equipment not in active use. All stand clear except one of us charged with the duty of once more screwing the case with its dry cells into the circuit. When this is done, the set is in order and ready for action. The man who does it keeps his head several feet from the flash. But for this precaution, we should have been badly burned more than once from premature explosions caused by short circuits. That is why we also make it a rule when visiting a set to remove the battery from the circuit first of all.

Once the set is finished, we must call upon all our reserves of patience and wait,—for this game of ours demands no end of patience and perseverance. If we are fortunate, we may have a "shot" inside of two or three nights. Given favorable conditions, the flash can be seen and heard for many miles. Whether we hear it or not, we must visit the set every second or third day to make certain that it is in working order and not merely idly decorating the landscape.

It is important to develop pictures as soon as possible after they are taken. Delay for any appreciable length of time is likely to result in some deterioration. But prompt action is even more important in furnishing a check on the apparatus. The negative will show whether or not the focus is accurate, how much field is being covered, the absence or presence of vibration, the efficiency of flash and shutter, any leaks that may have developed, what sort of animal has visited the set, and many other points of importance.

Finishing a picture at home in a good dark-room is one thing, in the field quite another. Much of the difficulty was overcome by the construction of a portable dark-room, one of Sturgis' outstanding achievements. It contains three trays and

a ruby light as well as pockets for holders and towel and small compartments to house stirring paddles and thermometer. When opened, black cloth covers the interior, allowing access through three light-proof sleeves, one for the face and one for each hand. Folded up and closed it has the appearance of a thin, flat carrying case.

Many different kinds of plates and cut films were tried out during the period of experiment and many different developers at varying temperatures. Plates were finally decided upon for convenience in handling, and a grade chosen to give adequate speed with a minimum of grain. The developer was a pyro formula.

Our ruby light was frequently so dim that we could not tell what our picture was to be until it was transferred to the hypo fixing bath and the dark-room opened to daylight. Before we could determine its quality we had to subject it to careful scrutiny under a magnifying glass after the hypo had done its work.

Running water is highly desirable for proper washing. This we provided by siphoning water from a large tank into a smaller one containing the negative. The large tank was kept full so that water might run into the smaller and there flow over the edge for an hour or so.

Smooth and rapid drying was another problem, solved by the use of a small electric fan that was hooked onto the battery of one of our cars. Thus we avoided as far as possible the collecting of dust on the wet negatives.

All plates were dusted with a camel's hair brush before being loaded into holders—a dangerous policy, as will appear. In the developer they were swabbed lightly with a wet piece of absorbent cotton to eliminate air bubbles and their resulting scars, and after the washing they were carefully and gently rubbed down with cotton, face and back, to promote quick, smooth drying. A good negative was never allowed to rest until developed, fixed, washed, dried, printed, placed in a protecting envelope, boxed, and put away in as safe a place as could be found.

Only a small percentage of possible mishaps can be reviewed. No imagination is sufficiently vivid, no experience broad enough to enable us to foresee what may happen. When a trip wire is used trouble is invited. Small creatures scurrying rapidly in search of food or sanctuary may rush into it at such high speed that they leave on the plate only an indistinct blur instead of a clear-cut image. We do not want their pictures anyway, but it is discouraging to set for some wild, shy carnivore, return to camp with a false sense of security, find the set sprung the next day, rush the plate into the developer with high enthusiasm, only to discover that one of these small denizens has visited it, perhaps within a few hours after our departure in broad daylight, and thus put the whole apparatus out of commission for the ensuing hours of darkness.

Birds are also a source of annoyance—song birds, as well as game birds and birds of prey. Sometimes they fly into the wire, sometimes they sit on it and sometimes they merely try to steal our bait. We use bait quite often in an effort to slow down the motion of the animal because any animal going through the wire at high speed will move too rapidly to be stopped by a shutter working at an ostensible speed of 1/200th second.

Occasionally, in heavy weather, a driving wind may carry wet leaves against the wire with sufficient force to shoot the flash; sometimes a falling branch will accomplish the same nefarious purpose. Even the accumulation of snow or the formation of ice on the wire may sometimes add sufficient weight to close the contacts.

Whenever bait is used, we have a race with the skunks. Once they find it, they gather around early and late and there is little chance, during their tenancy of the neighborhood, to flash anything else.

More troublesome still, fortunately infrequent, is the development of a short circuit inside some part of the insulation. Constant use and wear has more than once caused a break in one or two strands of fine wire. These may lie in place until after all tests have been made and the set completed and allowed to stand for an hour or so and then, apparently by their own weight, or the strength of their spring, work themselves into position to cross other wires, thus shooting the charge and taking a picture of the landscape.

In spite of our best efforts, it is not always possible in spells of continued bad weather, to keep the powder dry. When it is thoroughly soaked and caked, and thus very explosive, burning bits of it will sometimes fly out far enough in front of the lens to cause fog streaks and occasionally if the soaking is too severe the burning fuse will not ignite the magnesium.

Once in a long while some external disturbance trips the shutter independently of the flash. Then, when the powder burns, no picture is taken because the shutter has already prematurely done its work. Moisture on the lens, quite a common occurrence, if it accumulates to any degree and does not clear up before the flash is fired, shuts out too much light, leaving a muddy, foggy, under-exposed negative. Rain, and mist rising from inland waters are fertile causes of this difficulty.

Of course, the pose of the animal itself can never be regulated and causes numerous great disappointments. It is discouraging to set for coyotes or foxes and develop a picture of the soles of the feet of a rabbit! Even in out of the way sections of the country, domestic stock or feral individuals of domestic origin usually visit our sets in sufficient numbers to insure a fine series in varying attitudes. And casual bipeds are not immune to the unconscious lure of the invisible trip wire, especially if they see the camera and prowl about to investigate.

In spite of all the care we can exercise, mechanical difficulties will develop and what is much more devastating, a moment of inattention at any stage of the proceedings may lose us a prize. The shutters themselves are sufficiently delicate to be quite susceptible to changes in temperature and unless very carefully watched will at times fail to function. This is, of course, to be expected when the whole front of the camera is choked with snow.

The human element is always present, and wherever successful operations depend, as they do with us, on mechanical adjustments by human beings, mistakes are bound to occur in spite of constant vigilance and a scrupulous exercise of the utmost care and a most faithful attention to every detail. Occasional momentary lapses cannot be avoided.

After all these obstacles have been hurdled, there still remains the probability of error in the ensuing course of the negative from camera to filing case. Breakage, dust spots, developer burns, scratches, air bubbles, under-development, stains, and other irregularities are all constant sources of danger.

By this long and doubtless somewhat tedious recital, we have tried sketchily to suggest how low is the percentage of chance favoring success, and thus to excuse in a measure a reasonable sense of satisfaction, which it would be inhuman not to expect us to feel, when a satisfactory negative of a wild, shy, comparatively rare animal is finally safely put away.

III.

During the period of herculean effort in Chicago to complete the preparation of necessary apparatus on schedule, Young, in Washington, was far from idle. He marshaled his forces with that characteristic energy and efficiency that make him the splendid administrator that he is. He was in constant communication with his loyal associates in the field, urging them to greater effort, emphasizing his anxiety that the expedition should succeed, making constructive suggestions and in general doing everything he could to insure a vigorous and thorough pursuit of the problem. We had sent him photographs of the apparatus set up in the woods, illustrating as well as possible our requirements. These were accompanied by a detailed statement of the character of the apparatus and the methods followed in setting it up. All of this material had been forwarded to those in the field. Too much credit cannot be given to Young for his willingness and ability to keep in close touch with all of the work necessary to complete organization of our effort, while at the same time, under his new chief, being charged with new, exacting duties due to the enlargement of his division to include the management of Federal game preserves and bird refuges and administration of wildlife protective laws.

Don A. Gilchrist, one of his regional directors, was asked to stand by to head the Survey end of the expedition in the event that pressure of official duties should prevent Young's participation.

It was thought most likely that the requisite concentration of wolves might be found in a small group of Southwestern States. The services of A. E. Gray, one of the outstanding district agents in the Survey, were enlisted to make investigation himself and through his hunters, of all likely wolf country in Oklahoma, Missouri, Arkansas, and northern Louisiana. It was in no small measure due to his fine spirit and dogged determination not only that the wolves were eventually found, but that we succeeded so well in obtaining their photographs. A careful survey of the most favorable sections in Oklahoma and Missouri failed to disclose what we were seeking. In Arkansas, Andy Ray, Government hunter, had so successfully pursued Timber Wolves that they had become scarce, but complaints had come in from northern Louisiana indicating the presence there of no inconsiderable number, especially in East Carroll and Madison Parishes. Gray and Ray made a special trip

there to see what they could uncover. This section of the country was in the throes of an extraordinary drought and the condition of the ground made it almost impossible to find any wolf sign. The local hunters could offer little encouragement. They reported that there had been many wolves during the past few years, but that most of them had been trapped off. Even Gray, optimistic and persevering as he was, felt almost ready to admit defeat for the time being, but he agreed that Ray should make one more effort after the first fall rains.

No better man could have been chosen. To characterize him as the equal of any wolf tracker in existence is surely a conservative statement. So well versed is he in the ways of the wolf and so absolutely fearless that he makes it a practice to tie and remove by hand, alive, from the steel traps, wolves he has caught, without the use of rope or pole.

The drought was not broken until September. Then Ray made his second trip. At Tallulah he enlisted the aid of J. J. Kuhn, agent of the Louisiana State Department of Conservation; they scouted the Singer Wild Life Refuge in Madison Parish where Kuhn knew every foot of the ground. He had trapped many wolves there and his cooperation both in the preliminary survey and during practically the whole of our stay was invaluable. It did not take long for these skillful hunters to find wolf scratches and it was soon evident to them that here at last had been disclosed the range of at least one sizable pack of Timber Wolves (*Canis floridanus*).

Ray jumped in his car, full of enthusiasm and drove all night to get home and dispatch to Gray at the earliest possible moment the glad tidings of his discovery.

Gray's ensuing report to Young came through almost at the moment when we were ready to abandon the effort. Though it was then close to the middle of September, it did not take us long to fix on a definite date and place of meeting. The courthouse square, Tallulah, was designated as the place and the forenoon of October 6, the time. Gray and Ray were on the ground several days earlier to make ready the cabin we were to occupy and brought with them from Arkansas Tom Hill, colored cook. He was an excellent culinary artist, always cheerful and industrious and a great help to us all.

At last the day arrived for the start. The cars had been packed on the preceding afternoon and at daylight we were working our way out of the outskirts of Chicago. Our number had been very pleasantly augmented by the inclusion of Francis R. Dickinson, President of the Chicago Academy of Sciences, as one of the party. Few can equal him in the taking of motion pictures of birds. A keen observer, enthusiastic fisherman, interested in nature in all its phases, quiet, unassuming, with a delicious sense of humor, and always ready to do more than his share of the work, he made a delightful companion in the field.

IV.

It was about 11:30 on the morning of Saturday, October 6, when we finally rolled up to the appointed place of meeting. In two minutes Jack Kuhn had found

us and reported that Young had already been escorted to camp by Gray. We delayed only long enough to arrange for delivery of possible mail and telegrams and obtain a fishing license and then drove southeast the remaining thirteen miles to Ed Corkran's camp on Methiglum Bayou. Eight miles from town we left the concrete and followed an unimproved road to the gate of the camp.

The soil hereabouts is locally termed "buckshot gumbo." It was in this that the unimproved roads were laid out. In dry weather it becomes so hard that we found it possible to scratch a match on one of the ruts in the road. In wet weather it is of a consistency impossible to describe. Gumbo is as good a word as any. Apparently the "buckshot" characterization was inspired by the way in which, when dry, it breaks up into small pellets, almost as hard as buckshot.

It made us feel a little guilty to find how orderly the camp had been made for our arrival. Everything was clean and shipshape, new benches and tables had been constructed, stove all put in order, and Tom was already busy cooking the noonday meal. It seemed almost unbelievable that after all the busy months of planning and preparation we should at last be gathered together at our chosen hunting grounds.

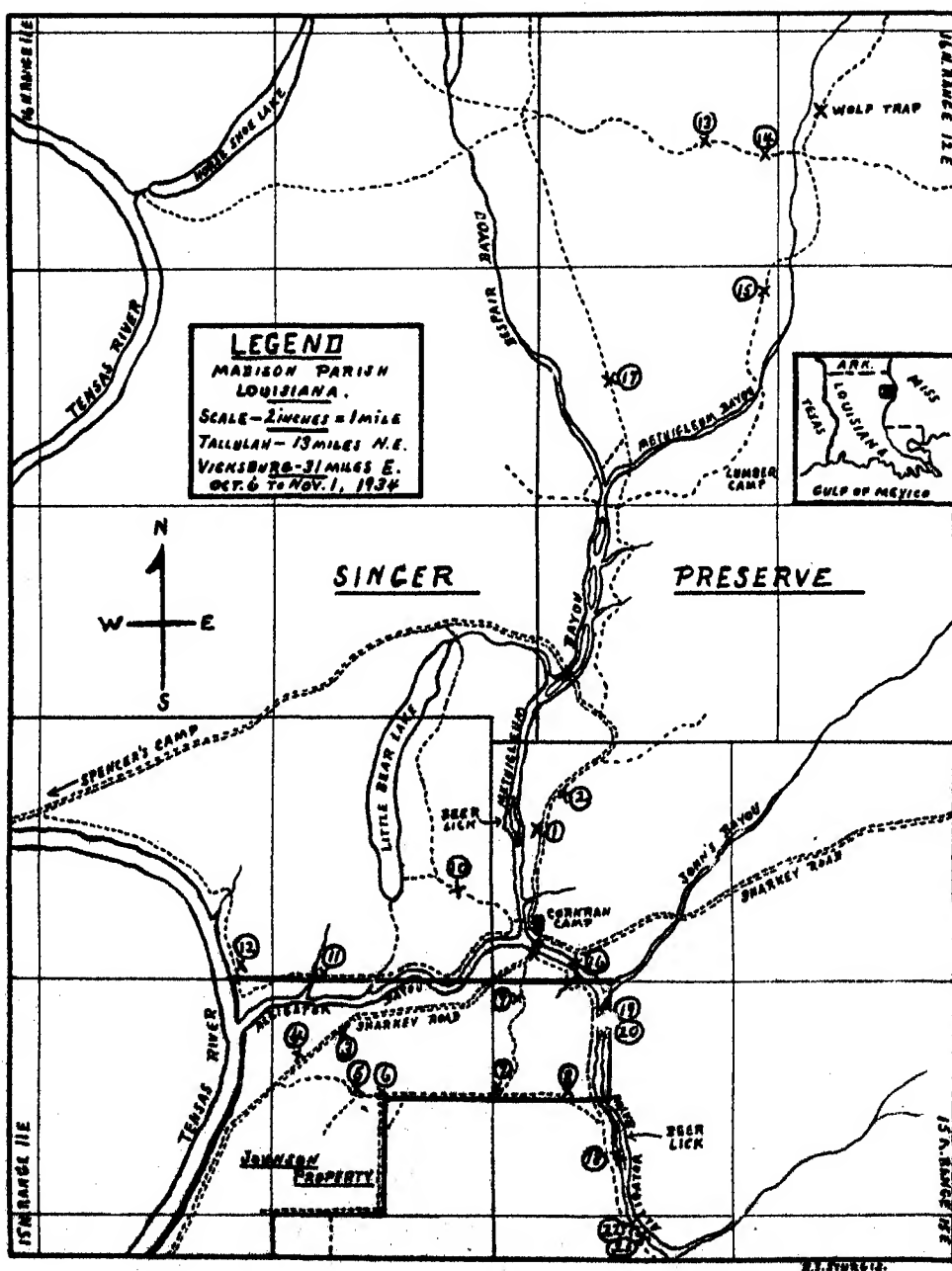
The Singer Refuge comprises about 82,000 acres of hardwood forest, lying on both sides of the Tensas River, which follows its tortuous course through the preserve on its way from northwest to southeast. In altitude the Refuge is perhaps at the highest point about 70 to 75 feet above sea level, and its flat acres are cut by numerous bayous, which in the rainy season are filled with water to overflowing. Some of them cut in to a depth of thirty or forty feet and others are very shallow. The summer drought had been so severe and the rains in September so light that during our stay there was only a sluggish residue in Alligator Bayou and Methiglum Bayou contained but a series of stagnant pools.

The prevailing timber is oak of many varieties. There is also considerable gum and honey locust, some ash and hackberry, and wherever the ground is damp enough, stands of typical cypress. Generally speaking, the woods are quite free from underbrush, though sturdy vines not infrequently impede progress. Occasional palmetto flats brighten the landscape, and there are sparse stands of switch cane here and there. A few elms and the ever picturesque festoons of Spanish moss pretty well round out the picture. Scattered lakes help in the irrigation of the whole.

Throughout our stay, we had but one day of rain until the day we left. The whole period was one almost unbroken series of bright, still, hot days, ideal for our purposes. At night the mercury dropped sufficiently to permit comfortable sleep.

No sooner had we arrived at camp than we were consumed with eagerness to set up one unit of our apparatus, gather our forces about it and hold a clinic as to its virtues and vices, and the details of how best to adapt it for field use on wolves. So we hurried our unloading and unpacking and in a surprisingly short time were sitting by the side of the road considering our problem.

One of the cameras had been mounted on a handy tree and Young had counter-sunk a tread in the road. The system finally adopted was something like this: A



SINGER PRESERVE
 Map showing location of sets. Inset gives position of Madison Parish in Louisiana.

shallow hole was dug just the size of the tread and of such depth that when earth was lightly sprinkled on top a slight depression was left. This hole was then enlarged at the top to leave a shoulder on four sides, of a width of perhaps an inch or an inch and a half.

In the buckshot soil in dry weather this shoulder became very hard and was quite effective in holding in place the canvas cover stretched across the tread and nailed to the earth at its four corners. On one or two of our sets we had some difficulty, caused by the breaking of the shoulder into small lumps which, when in contact with both plates of the tread and damp from collected moisture, caused leakage of current and thus ran down the strength of our dry cells to some extent.

Of course, it was necessary for those charged with the duty of burying the tread at each set to exercise great care not to leave human scent. A foot print left in walking past the spot was not of sufficient importance to necessitate the use of canvas overshoes that had been buried in manure, although they were sometimes employed. It was important, however, that at any point where one of us intended to stand or kneel for some length of time, a spread-cloth about three feet square be first laid upon the spot. This was the invariable practice. The spread-cloth had been buried in manure to kill the human scent, and as an added precaution cotton gloves similarly "de-scented" were also always used.

The earth removed in making a place for the tread was placed upon the spread-cloth, carried away 50 or 100 yards, and scattered in the woods, and surface soil resembling as closely as possible that removed, was brought in on the spread-cloth from a distance and carefully sprinkled to cover the tread. It was then dusted and fanned and made to look as natural as possible so that no passing wolf might know that the ground had been disturbed. Stanley Young and Andy Ray took care of this end of the setting operations, and a wonderful job they did. In addition to burying the tread, they had to cut a trench for the long cable of the harness and cover that with no less care.

Now we took counsel as to the advisability of proceeding at once to the selected sites where wolf signs had been found and there opening our campaign and decided that it would be wise to make it a rule always to complete the sets and leave the neighborhood as early in the afternoon as possible. The purpose of this was to give the sun time to burn off the vestiges of the human scent we must necessarily leave. In dry weather this would only require two or three hours. Then, when darkness fell and the wolves began to move around, there would be no sign of our having been there to alarm them.

But the noon hour had long since come and gone and there still remained additional useful scouting to be done. We therefore abandoned any thought of further work with the cameras that day, divided the party and wandered off on wood roads north and west.

Half and three-quarters of a mile north from camp, we found two wolf scratches made the night before, and discovered another fresh scratch within a half mile to the



THE ROAD LED NORTHWARD FROM OUR CABIN

west. A wolf is like a dog. After he has relieved himself, he scratches on the ground. The size and the length of these scratches vary with the vigor of the animal. Sometimes he will come to the same place for this purpose repeatedly, day after day, and use perhaps a bunch of grass or palmetto or weed or point of dead brush. Such a spot is known as a "scent post" and when one of these indicates by the signs that it is old and well established, and when fresh scratches also appear there, then we have found the most likely spot available affording the best opportunity for a picture.

That night we talked of our hopes and fears. It was clear and still and the Barred Owls made music all night. They serenaded us continuously during all our stay. We spoke of the chances of success; with ten cameras on duty for four weeks, with favorable weather and on top of that with great good luck, it seemed that we might possibly procure one picture. The discussion was not of long duration. None of us was anxious to dally too long before rolling in, knowing that daylight would be the signal for starting the day's adventures. Soon the camp was quiet.

V.

Before we could realize that the night had passed, Ray was rustling around, routing everybody out and soon Tom Hill's cheerful call brought us to breakfast as the first rays of the sun appeared through the trees.

Little time was occupied over the meal, appetizing as it was. We were anxious to be off. Six cameras had been made ready and carefully packed. Two of these we took north, thinking that the very freshness of the sign and the fact that the scratches were at established posts, made it worth while to try these two locations.

Owing to the character of the country, it was not difficult at any of our sets to find conveniently located a tree of satisfactory proportions. To serve its purpose properly, we concluded that it must be not more than eighteen feet away from our bait and not closer than twelve feet. At eighteen feet, with the diaphragm of the camera wide open at F.4.5 we felt quite sure there would be sufficient light to photograph even as dark an object as a wolf in dark surroundings and at twelve feet our angle was broad enough to include the full figure of a wolf on either side of the plate. There was no little excitement attached to the making of that first set. It had so long been anticipated and the signs made us so hopeful that we approached the task with impatient enthusiasm.

The first act, of course, was to select the exact spot for the location of the tread. This time a tree of about eighteen inches diameter, eighteen feet away, was chosen on which to mount the camera. Then we all set to work. In about half an hour, the tread and cable were buried, the ground made to look as natural as possible, camera and lamp installed, focusing all done, and as the two final acts, a few drops of scent were added to the old post and the battery hooked on to the circuit.

The scent used on the first ten sets was urine taken from a wolf that had been trapped in Arkansas. At our later sets, there was added to this a certain proportion of zinc valerate and enough glycerine to give the whole some body and prevent its being too readily washed away by rain. At three of our six sets made on this 7th of October, the lamp was strapped to the same tree that held the cameras.

By 8:35 a. m. the first set was complete and it was with a tremendous sense of satisfaction that we moved on. We felt that chance had favored us in that we not only had what happened to be an active post at the set just finished but a very effective background. All that was needed was the foot of a wolf on the tread. Dangerous and meaningless conjecture. It frequently happens, as it did here, that the set giving the greatest promise of success is a flat failure, while one hastily thrown out as an afterthought, may bring the finest results.

This number 1 set of ours, which was kept on duty, in good order, during the whole time that it remained out until it was picked up on the 19th of October, brought us four pictures of pigs, varying in number. Most of these shots were doubtless set off by Jack Kuhn's old sow and her little ones. In other words, as Sturgis so aptly put it, "We set for the big, bad wolf and we got the three little pigs!"

An hour later we had finished our second set, two hundred yards or so farther north along the road. Here too the camera was left out until the 19th and disappointed us greatly. This was one of the sets that gave us some trouble with leakage of current and necessitated constant replacement of batteries and the net result of



THE TRAIL LED OVER AN "UNSAFE" BRIDGE

it all was one picture of dogs, horse and the legs of the rider, and another picture of the pig family! A good illustration, perhaps, of the difficulty we should have experienced in guessing the movement of the wolves and bringing them to our treads had we been limited to two or three set-cameras.

Another unforeseen difficulty developed in connection with this camera. Many of our plate-holders were single and made of metal, and the slides were also of metal. When we had brought one of the plates in with the slide in place and tried to take it out in the dark room, the picture having been taken the day after a heavy rain, we found that moisture had stuck plate and slide so tight together that it was necessary to destroy the holder in order to get at the negative. The same thing happened on another occasion and thereafter whenever there was any chance of the set having been visited by a wolf, judging by the sign, we picked up the whole camera without using the slide at all. That meant keeping one camera idle and employing it as a sort of rover to substitute for the one taken up.

With number 1 and number 2 sets in good shape, we returned to the cabin, picked up four more cameras and took a course southeast from camp along the Sharkey Road. To cross Alligator Bayou we had to use an old bridge bearing the legend "Unsafe, travel at your own risk." We took the risk and later on thought little of it, reassured greatly by the sight of motor cars, horses, and wagons loaded

with cotton making the crossing without mishap. Two or three hundred yards beyond the bridge the Singer Refuge was interrupted by a tract of land known as the Johnson property, and it was on this land that we made our next four sets.

More than a mile of the Sharkey Road had been covered before we came on a fresh scratch. Here the post was on the south side of the road, where the woods were so full of brush that it was impossible to find a satisfactory location for the camera. We placed it on the only available tree on the north side of the road, but this was of such small diameter that we did not dare risk the lamp on the same tree, and instead mounted it on a separate stake. The burying of the cable was an exacting task, because it must pass across the road and have a deep enough layer of ground over it to protect it from passing wagon wheels. Number 3 was another disappointing set. For fourteen nights it stood on duty and brought no returns. The only wild life seen near it was one skunk. Perhaps he did not step on the tread, but if he did, it served its purpose well, for then it must have resisted the pressure of his weight and saved itself for possible larger game.

Now we moved slowly along the road another quarter of a mile, searching and watching carefully for sign of wolf and a place for number 4. At last another fresh scratch. Good luck this time, for it was on the north side of the road, in good range for a tree of one foot diameter. Here again we seemed to have a regular post to work on and in addition to the scratch, found a good sized wolf track near the set and pup tracks on the road a short distance toward camp.

Time was beginning to run against us. Operations were not completed until about 1:30. We had been working hard since breakfast—walking, carrying heavy packs, digging in the hard ground, standing on our feet, stimulated by excitement and anxiety that we might make no fatal mistake. But two cameras remained of the number we had allotted to the day's work and we thought if we hurried we might get them out and move away soon enough to give the sun a chance to do its work. And there was plenty of sun that day, making itself amply felt in the heavy atmosphere of this lowland country.

Within a few rods of number 4 set, we came to the junction of the Sharkey Road with a wood road and there took a course to the east. Probably we walked a little less than half a mile to the next scratch. Some doubt was expressed as to the advisability of setting here, but Young thought it worth a try and Ray was quite enthusiastic. The road dipped down into a little draw and the post was on the down slope. With a background somewhat brushy and weedy, and the only available tree for the camera enmeshed in tenacious vines, we were not particularly attracted to the prospect. However, we did the best we could, albeit with perhaps too much haste, placing our lamp on a small sapling directly behind our camera tree, and finishing the work on number 5 at 2:30 P. M.

While Ray had been busy at the tread, Young had gone ahead with Kuhn to prepare for another set at a very choice spot, two hundred yards farther east, practically at a road intersection on the "white line," marking the boundary between

the Johnson and Singer tracts. This line consisted of a series of blazes painted white. Shortly after 3 o'clock the last camera was in order. It was not sprung until the 14th and then by a steer in daylight. On the 15th we picked it up and on his round of inspection with Sturgis on the morning of October 16, Ray saw a bobcat wallowing on the very spot where the tread had been buried!

We scouted about half a mile farther east along the road, finding another good place where a set might be made the next day, and returned to the bridge by another wood road, recrossed, and so came back to camp. In all, thirteen scratches had been counted, made within the last week.

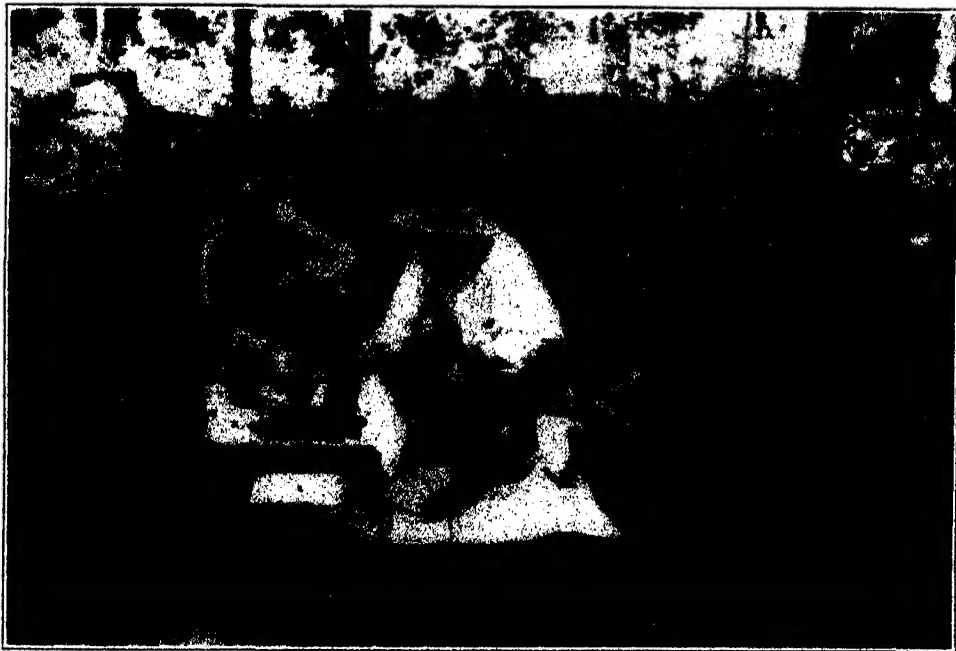
As the sun went down and the temperature dropped, it was pleasant to stroll to the bank of the bayou and sit quietly for awhile watching a jet black squirrel feeding at the tip of a small limb, high up in a locust tree. The individual squirrels in the black phase that we were able to examine carefully showed no white on their faces. In this country of dark woods and dark soil, the black phase in various mammals was not unusual. Besides the squirrels, we saw a skunk with no white on it except on the top of its head and the nape of its neck. Among the wolves, the black seemed about as numerous as the gray.

Darkness found us all sitting on the porch of our cabin, facing toward the south, chatting of the day's work, planning for the morrow, ever on the alert for sight or sound of flash. For the first hour or so the conversation was desultory. The thought of our cameras was uppermost in our minds. Gradually, however, we forgot about them and talked more freely and then, when we were not really ready for it, the boom of a distant flash came to our ears—at 8:30 P. M.! No end of speculation ensued as to the identity of the subject.

VI.

Early the next morning Sturgis and Ray took our two horses and rode out on the south line to pick up the negative made by the flash the night before. They found that number 5 had been sprung. About one-quarter of the canvas covering the tread lay exposed and the dirt was banked along the margin. The strip of canvas might well have been cleared of dirt by the stroke of a wolf's paw on his first jump. On the other hand, some smaller animal might have made this mark by persistent scratching. None of the other sets had been touched. The camera at number 5 was promptly reset and the tread rearranged. Then no time was lost till the negative was finally immersed in the developer.

With our ruby lamp rather dim, it was impossible to tell what we had, but it did not do to take chances. Every care was exercised, and after the fixing bath had had a moment or so to start work, the darkroom was opened up. Anxious fingers immediately reached for the plate and held it up to the light, disclosing to our delighted gaze a very good picture of a dog wolf in the black phase. Thus, after several years of planning and a year and a half spent in careful preparation, we had accomplished our mission within thirty-six hours after reaching camp and within six hours from the completion of the set that was sprung.



RAY AND YOUNG BURY THE TREAD

It gave us, of course, a tremendous sense of satisfaction and it immediately relieved all tension and enabled us to pursue our further efforts with a smug equanimity, perhaps unjustifiable, but certainly understandable. We felt we had made new wolf history. So far as we knew, no Timber Wolf had ever been persuaded to take its own picture in its natural habitat.

It has been our uniform experience, when a particular set brings in a good picture, that we have great difficulty in persuading ourselves of the advisability of ever moving it. Sometimes this feeling is supported by a measure of logic, but frequently not. Number 5 was no exception. It was left out on the same spot and kept in working order until the 28th of October, yet never again fired a shot. Nor did we find on frequent visits any further sign of wolf in its vicinity.

That morning two more cameras were set up, numbers 7 and 8. Both were on the same road we had been following the day before. Number 7 was never shot though it stood until the 28th. Three times we were compelled to change the cells in our battery box at this set because of leakage. Some other minor troubles also developed, such as the loosening of the lens, requiring refocusing of the camera. Everything of that sort operated against us. The more often we had to visit our sets, the more scent we left, and the less likelihood there was of a visit from a wolf. These two sets, made on the 8th of October, were both at good posts, with fresh scratches.

Number 8 did not do much better for us than number 7. It went off twice, once in response to the heavy step of a steer, and the second time of its own accord. Our tread was not calculated to resist the weight of a steer. As a result, it was badly bent and in our anxiety not to disturb the place too much, we were not at sufficient pains to straighten it. That was undoubtedly the explanation for the second shot. Here again we had some trouble with loss of current and twice replaced the cells. On the 23rd of October the set was moved with considerable regret, as it had appeared to have great possibilities. It was in an interesting section of the country and did furnish us with some exhilaration on one of the trips of inspection when we had a fine view of a flock of wild turkeys coming into the road ahead of us, moving silently away and turning off to disappear within a few rods.

These last two sets were finished by noon and though the day was clear and hot, with the mercury rising to 90, we reconnoitered as far as Alligator Bayou, scouted a deer lick, there finding many fresh deer tracks and the fresh track of a cat in the trampled mud, then cut back across country, through an old slashing to where a fallen log offered us a crossing near the road to camp. While we were out we had counted fourteen wolf scratches made the night before, one of them about twelve feet long and had found both fresh droppings and fresh tracks.

Dickinson, meanwhile, had investigated another natural deer lick above camp on Methiglum Bayou. He spent some hours there on different occasions in a natural blind, hoping for the opportunity to make motion pictures of deer. In this he was disappointed, but during one of his sessions he made an observation of no inconsiderable scientific importance. For half an hour or so on the 13th of October he watched a male Ivory-billed Woodpecker working on a cypress tree in full view. Before it disappeared, he also had a brief sight of another one that joined it. Gray also reported seeing one of these birds in Hunter's Bend on the Tensas on October 28.

Resolved as we were to keep out of the wolf country as much as possible, we were left with nothing to do but try to keep cool during the hot hours of the afternoon. It is not surprising, then, that they did not seem to pass with great rapidity.

By evening of the 8th, the clouds were piling up and there was a threat of rain. Again we sat on our front porch waiting hopefully for another flash, but this time nothing was heard save the usual owls every now and again, bringing us up alert by the resemblance of their calls, heard in the midst of conversation, to the voice of a distant wolf. And in some cases we could never be sure. At nine o'clock we thought we heard a wolf far away.

All day the 9th of October the rain fell steadily, and Dickinson was the only member of the party hardy enough to venture out. He went as far as Little Bear Lake and brought back a nice bass for supper. At about 5 P. M. the rain stopped and by 10:30 the sky was again clear. We heard a shot at 10:30 and another at 11:20, but the next day when we struggled through the gumbo mud to find out where the picture had been taken, we were astonished to discover that none of our sets had been visited. So, when at 8 o'clock on the evening of October 10, after a muggy, sultry day,



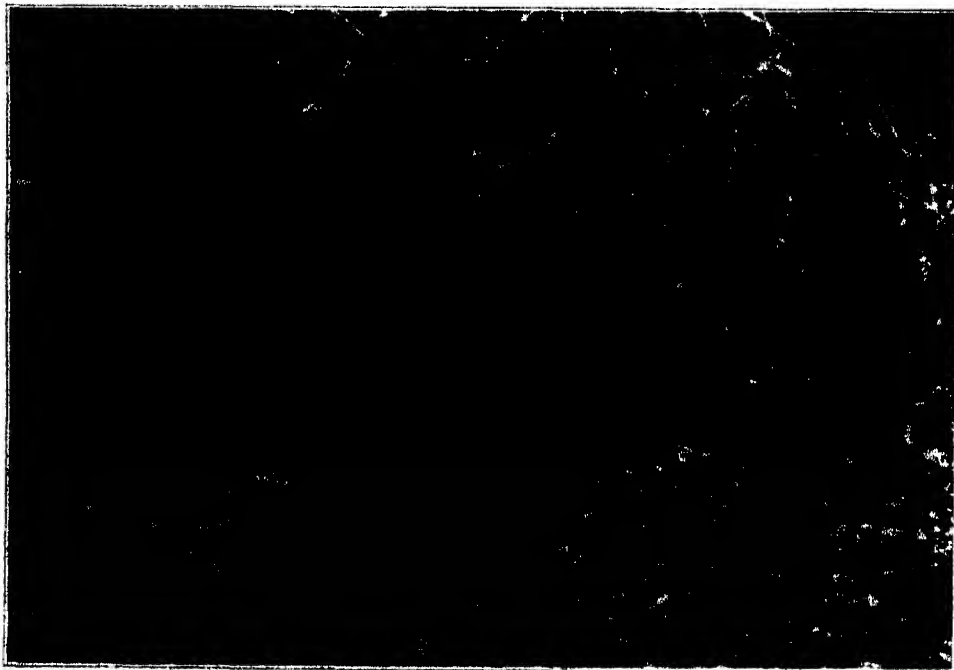
RAY WITH THE HORSES

It was here that we photographed the running wolf

we heard again a distant boom, we were suspicious and did not count it a picture, though we took heart somewhat when at 9:05 wolves barked southwest of us. On our trip of inspection that morning, we had added fresh scent at our number 4 set on the Sharkey Road and finding that the rain had washed the earth off one corner of the canvas over the tread, pegged down three leaves to cover this spot.

In spite of our skepticism, it was, of course, indispensable that we visit our line on the morning of the 11th. It was another fine, clear day, with an early morning temperature in the 70's, rising close to 90 by mid-afternoon. We made it a rule, wherever possible, to leave the cameras undisturbed without going near them for at least two nights in succession. Therefore, being certain that if the shot of the evening before was a flash, it was not from either camera on our north line, we set out directly to cover the south line by way of the Sharkey Road.

We made the best progress we could through the slippery mud, dipped down across a little draw and there on the road found wolf tracks made the night before. As well as we could tell, there were three wolves traveling together. One big one made a track measuring $3\frac{1}{2}$ x 4 inches. He was accompanied by a wolf with one toe missing, and a pup. We followed these tracks, back-tracking them as they came down the road towards us, becoming more and more hopeful at each step that we



THE RUNNING WOLF IN ITS NATURAL HABITAT

should find number 3 sprung. Then all our hopes were dashed and we were plunged into the depths of despair by the discovery, before we reached the set, that there were no more fresh tracks. We had no way of knowing whether the wolves had been alarmed by the camera or whether they had simply been hunting on and off the road and had by chance turned off too soon. Hope was soon revived, however, brighter than ever when we picked up the trail once more. And this time as we approached number 4, hope became certainty at the sight of tracks with claw marks dug deeply into the mud and made by a running wolf.

Sure enough, the flash had been discharged, the tread scratched up, and we could see plainly where the animal had stood, where he had turned for his first leap, where five feet beyond he had come to the ground again with all four feet gathered under him and taken off down the road. After traveling perhaps 150 yards, he quieted down and slowed his pace to a more normal gait.

Fifteen feet the other side of the tread, a fresh scratch appeared, and tracks of a big wolf going in the same direction that we were following. It seemed that he had passed the tread once, turned, retraced his steps, and, as he was about to pass it again, swung aside from the road for one good sniff with his ears laid back, and put his weight where we wanted it.



THE FLORIDA BLACK WOLF
A remarkable photograph of a rare animal

In addition to the wolf tracks, we found fresh cat tracks on the same road, but no other set had been sprung. Development of the negative brought disappointment. The picture of the wolf was probably worth saving, but the flash must have been extraordinarily explosive, for it jarred the tree, or at least the shutter, sufficiently to leave the unmistakable double lines of slight vibration in the picture. We know that this was a bigger wolf than the first one taken because at this set we used the same kind of a camera and it was further from the tread than was the camera at number 5 set, yet the image of the wolf on the negative is larger.

Of course, the exact size or weight of any of these animals that we photographed can only be guessed at. We did try an interesting experiment at the number 5 set to give us as accurate a measurement as possible. We rested one end of a rigid steel tape measure on a forked stake and extended it, holding the other end in the air, in as nearly the position occupied by the wolf as we could determine, and photographed it with the camera on the tree as it had been for the wolf picture. By printing these two pictures together, we are able to approximate the length of the wolf fairly accurately, and on a conservative basis it is shown that the first wolf was about five feet ten inches long from the tip of his nose to the end of his tail vertebrae.

VII.

On the afternoon of October 11, we made our number 9 set about 500 yards southwest of camp. Here there was no post. The terrain looked favorable, but though the set was left out eight nights, it was never sprung.

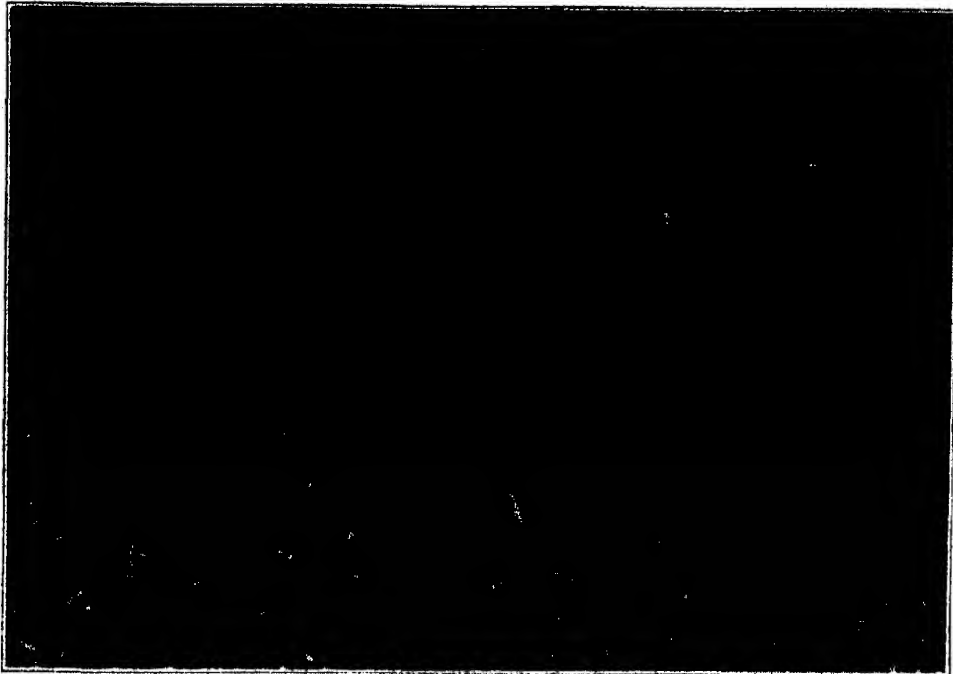
That night there were serious questions to debate. And the discussion was only momentarily interrupted by the sound of distant wolves at 7 o'clock. Grave apprehension was felt lest all subsequent charges might be so explosive as to jar the camera each time and cause enough vibration to ruin the picture. To guard against this, perhaps all lamps should be removed from camera trees and placed on separate stakes. We had purposely refrained as much as possible from using stakes, lest they tend to alarm the wolves. But to change the lamps would require a trip to all of the sets the next day, contrary to our established practice, and might keep them too much stirred up. It was finally decided, however, that this was the lesser of the two evils. Accordingly, in the cool of the next morning, we visited all of the sets, finding none of them disturbed, and shifted the lamps wherever necessary. Near number 4, a fox squirrel lay dead in the middle of the road, with throat and breast opened up and eaten out.

In the afternoon, Young, Gray, Ray, and V. W. F. Jefferson, one of the Singer wardens, brought in a live rattlesnake. Jefferson had driven it out of a brush pile and snared it with a noose on the end of a long stick. It was quite a good sized specimen, five feet, two inches long, and weighing four pounds, and the only one seen by us during our stay.

Long before daylight of the 13th, we were awakened by the yapping of wolves. This time they were west of us. Ray and Sturgis took the horses after breakfast and made a thorough reconnaissance in that direction, covering the territory between camp and the Tensas. They reported considerable fresh sign, but fresh sign was also found on our south line. We felt it necessary to make the rounds of our sets that day to freshen the scent bait and also in order that we might accurately chart the position of each set on our map. That afternoon we put out our last camera, number 10, on the nearest of the fresh scratches west of camp. It was not at a regular post, but covered the road to Little Bear Lake, a likely wolf route.

The series of clear, still days continued unbroken. Sunday, the 14th, was no exception. At 6:45 in the morning the temperature was 52. By 1:10 P. M. it had gone to 83. When we read it again about 4:30, it was standing at 75, well on its way down. That evening was quite fresh again. By 6:30 the next morning it had only come back up again to 51. This range of temperature changes was characteristic of practically the whole period of our stay.

Unfortunately, the sets had to be checked again on the 14th. Two shots had been heard in the morning. Most of us sat around that day visiting. It was Young's last day in camp as his official duties called him away at noon. We felt depressed to see him go and missed him greatly.



ON TRAIL WITH NOSE TO THE GROUND
Another wolf at number 13

The bright sunlight and the still, clear air and genial warmth made it difficult for those of us from the North to realize that this was mid-October. We marveled at the fullness and variety of bird song all about us, and listened with interest, noting as well the call-notes of those birds not trusting themselves to the rendition of more elaborate numbers. Cardinals were numerous and cheerful as ever. Mockers regaled us daily. Carolina Wrens sang with great regularity, and many others made up the chorus, while the great Turkey Buzzard soared on high and the Black Vulture sat gloomy and morose on the stark limb of a nearby dead tree. The Shrike was frequently in evidence and always near and far the strident call of the Pileated Woodpecker rattled away.

The pictures brought in that day were of men and steers! Again in the west, soon after dark, wolves were plainly heard. We well knew that our frequent trips to the south line were exercising a baleful influence, but each time that we resolved anew to give the cameras a rest, one of them would be set off and once more a trip of inspection became unavoidable. So it was on the 15th, and again on the 16th, and always the results were the same—nothing but pigs or dogs or blanks.

At length we were satisfied that the wolves had left the neighborhood of our south line and that we must follow them and seek them elsewhere. Too many visits to sets and too much traffic on the Sharkey road undoubtedly contributed materially

to this change of their range. Perhaps the constant exploding of the flash powder was also a factor.

The logical place to turn next was the country to the west, where wolves had been so recently heard, and fresh signs so recently discovered. Accordingly, on the 15th, *finis* was written to number 6 set and the camera was moved to an active post and set by a fresh scratch near an old foot-bridge over a dry bayou, close by Alligator, about one mile due west of camp. As we worked our way slowly along the trail—two on horseback, one on foot—turkeys jumped up ahead of us and an old hen hopped on to a log across our path, to hesitate a moment before making her silent getaway.

As usual, no sooner was the set completed than we were once more fired with enthusiasm. Hope burned brightly again. We did not see how a wolf could fail to call once more at this choice spot. We might have known that chance greatly favored the logical sequel. This set did not give us a picture and was picked up on the 30th of October.

Half a mile or so farther, to the west, we brought our number 4 set and put it up on a trail close to the bank of the Tensas, within a few feet of an old post recently used. Here Ray tried a new experiment by making a scratch with a stick to simulate that of a wolf. As far as wolf pictures were concerned, we were again doomed to disappointment, but here there was plenty of activity and we were accorded some novel and interesting results. Six times the flash was discharged. Once a man walked on the tread early in the morning. How long he continued to walk after the flash we have no way of knowing. Twice the ubiquitous pigs left us a picture, and once we received a momentary thrill when we pulled from the hypo a negative that, in its then cloudy condition, showed us only a pair of straight hind legs and a bob tail. It did not take us long to discover, when it had cleared, that it was just a dog, and not the hoped-for bobcat.

But the two most interesting shots were a blank and a picture of a steer so large and so close to the camera that it could not possibly have stepped on the tread and fired the flash. It occupied so much of the plate that it was impossible for us to see beyond it and we shall never know the answer, though the signs on the tread looked as much like turkeys as anything else. We read sign on the occasion of the blank with great care, and while we may be in error, it did seem to justify this finding: A steer stepped on the battery case and crushed it in, without doing any serious damage, then bumped into the lamp stake hard enough to pull the cable release and trip the shutter with sufficient force to jar the camera loose. Thereafter, turkeys walked on the tread and fired the flash, but, of course, no picture resulted as the shutter was not set.

VIII.

The moon was waxing. It had reached its first quarter. Leaves were falling rapidly, making it more difficult to read sign. The weather remained hot and still, and no wolves came to our sets, though we heard them once more early in the even-



ALLIGATOR BAYOU

ing of the 17th in the west. Our fortunes had reached their lowest ebb. We were worried and restless. But Gray did not lose heart. On the 18th, he and Kuhn took the horses and rode hard to the north. They covered quite an expanse of country, reaching out perhaps four miles north of camp and extending from the banks of the Tensas to the east for a distance of two or three miles. Here, between Despair and Methiglum Bayous, they found again many fresh wolf scratches and fresh tracks. Once more our spirits were refreshed and our hopes buoyed up. In council that evening it was decided that three of our cameras should be picked up and moved to the new range.

These were the first three sets where we used scent that had some zinc valerate mixed with it. Every precaution was exercised, even to wearing overshoes in the vicinity of the new sets. All three were made on old roads.

On the morning of October 19, sets numbered 1, 2, and 9 were picked up, and packed ready for use in the new territory. By 11 A. M. we were on our way. We never visited our cameras very early in the morning if we could help it. It seemed wise to wait until the sun had had opportunity to dry the dew from the grass, weeds and brush. There is no better way to leave human scent than to handle or rub against wet vegetation. The horses were sent ahead to a point one and seven-tenths of a mile from camp, where a narrow trail wandered off from the road. One of the cars was loaded with apparatus and driven to this point, and here everything was

given a careful overhauling and put in good order. Now we packed the horses and pressed on with due allowance for the speed of the man on foot. It was not thought wise to require either horse to carry double, so with three of us on the trek, one must travel on foot.

Our three new sets carried the numbers 13, 14, and 15. Numbers 13 and 14 were made at regular posts by fresh scratches, and 15 lay midway between two posts freshly scratched and about 20 feet or so from each. Numbers 14 and 15 were never sprung. Before 3 o'clock in the afternoon of the 19th, we had turned again toward camp.

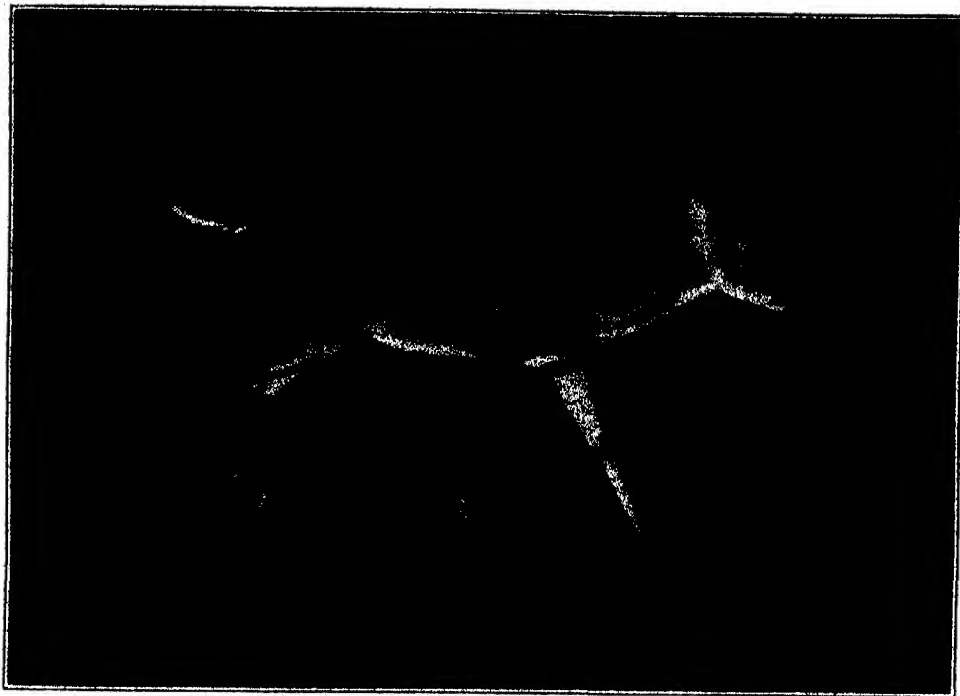
With our north line well established, we were at last able to allow the cameras some respite from tours of inspection, heretofore altogether too frequent. The sets on this line were so far away that we knew conditions must be extraordinarily favorable if we were to hear the flash at all. Number 13, for example, was about three and one-half miles from our cabin in a straight line. Of course, occasional visits must be made to freshen the scent bait and we still felt it necessary to check our south and west lines once in a while, though the hope of further wolf pictures there had almost reached the vanishing point.

Meanwhile the mercury continued the regular set program of rising to great heights in the middle of the day. Fortunately, however, the inspiration to acquire a set of horseshoes in Tallulah had rescued us from the ravages of ennui. No longer were we at pains to find occupation for the hours of enforced attendance at camp. No longer did we have time to consider the temperature, and the hours, instead of dragging, appeared to have wings. Competition was keen and the feeling of rivalry ran high. Tournaments and championships seemed to organize themselves automatically. Poor Tom was nearly distraught as he called in vain and his carefully prepared victuals became cold. When darkness fell upon the field of battle, the headlights of automobiles were turned on and the two hot corners flooded with their brilliant white light. So the days passed all too rapidly.

We were ever on the alert, listening for a distant shot, trying to distinguish it from the gun shot of a "fire-hunting" poacher.

On the 21st, Sturgis and Ray rode in from the north line to report fresh scratches on the very spot where we had left our car two days before! They found also eight other fresh scratches, all of them south and west of the cameras. One deer and a small flock of turkeys had crossed their path, but none of the sets had been visited.

We picked up number 3 that day, and set it on a log lying across Alligator Bayou, numbering it, of course, 16. The hope was that a bobcat might use this crossing. After four nights, with no results, it was brought back to camp, as we wished to take it with us on a reconnaissance made to the south on the 25th. Kuhn had seen some fresh sign in this direction and it was thought wise to cover the country as far as Mack's Bayou, which lay perhaps five miles to the south of us. But, though we worked conscientiously, we could find no fresh tracks or scratches.



A SPIKE-HORN LOUISIANA WHITE-TAILED DEER
Odocoileus virginianus louisianae
Photographed the last night in camp

At last, on the evening of Monday, October 22, at 10:05 P. M. a shot to the north was heard. This was the fourth night on which the cameras on this line had remained out. It encouraged us no end to hear from them at last, and it came at an opportune time, as our numbers had been once more depleted. Dickinson had turned homeward, leaving us with spirits much depressed.

Inspection on the 23rd, of number 13, showed a clear scratch cleaning a section of canvas and leaving a definite claw mark, suggesting wolf. Confirmation was had in the darkroom. A black wolf, hunting along the trail, inattentive to our choice scent bait, was taken in full stride. He moved too rapidly for our shutter speed but the picture is so characteristic of an attitude often imagined and seldom seen that we make no apologies for listing him among the immortals.

One disturbing influence interfered in the neighborhood of our north line, almost at the moment of the setting of the first three cameras. Someone constructed a big, stockade-like trap for wild hogs. We felt no certainty as to the effect of this man-made structure. The many fresh wolf scratches in its vicinity or south of it suggested that perhaps the wolves did not like to pass it and therefore did not frequent their old haunts quite so freely as before. On the other hand, the picture of the running wolf was, to some extent at least, a refutation of this theory. Possibly the trap was

attracting wolves. It was certainly tenanted by tempting fresh meat. Consonant with this line of thought, it was decided that one more camera should be set on the old cut-out road passing the hog trap. Number 8 set was selected for this purpose, dismantled and transported to the chosen spot about two and a half miles north of camp.

Now at last our sets were scattered in such a way that they fell into three natural groups, and for the next few days we took these groups in rotation, checking up and rebaiting the three sets on the west line on October 24; the remaining two sets on the south line on October 25, and the four on the north line October 26.

At number 17, on the north line, we found once more the telltale scratch on the canvas, indicating wolf. A wolf had been there. He came in towards the camera over the tread, setting it off with pressure from one of his hind feet. He has the appearance of stalking the camera. Perhaps he was and perhaps not. Any conclusion drawn from the negative would be but the wildest guess.

It was in this picture that we received the keenest disappointment of the trip. The plate was covered with marks, evidently made in dusting with the camel's hair brush. The probabilities are that these marks were caused by some of the hairs of the brush being wet with hypo without our noticing it. We tried to be as philosophical as we could, and as practical, and wasted very little time in vain regrets, once we had satisfied ourselves as to the cause of the trouble. Too much was left to be done in the remaining hours of daylight. Every one of the fresh plates then outstanding in the nine cameras in the field had been dusted with the same brush. It might well be that every one of them bore the same endorsement of scratches. The course to be followed was hardly debatable. We must, in this emergency, go counter to basic principles and replace each of these plates, even though that kept us in the vicinity of the sets until shortly before sundown. Two of us undertook the work on the west and south lines on foot, while the horses carried Gray and Sturgis on a hard ride to the north. Haste was the watchword. When the job was done and time permitted us to take stock, chagrin was tempered with satisfaction in the knowledge that we had not allowed a night to pass without taking every precaution, however burdensome, to keep the apparatus in order.

The virtue of developing promptly in the field each negative secured was demonstrated when we discovered that the unexposed plate removed from number 13 set bore similar marks, and was emphasized a hundred-fold when we brought in from that same camera on the 27th an excellent picture of a dark-coated wolf, quartering away from the camera!

Number 17 had also been shot the night before, but by a steer, though the sign indicated that a wolf had been there after the flash. This trip of inspection so soon after all the sets had been visited was made because we heard a shot at 6:50 that morning,—undoubtedly the steer.

In the afternoon, Gray came back from Tallulah, reporting a rare sight on the Sharkey Road—a wolf pup stalking four turkeys. He took alarm at the car and slunk off without succeeding.



THE EASTERN RACCOON

Procyon lotor lotor

IX.

The period of still, hot days was drawing to a close. After a maximum reading of the mercury at 85 on the 27th, a northerly breeze sprang up; flocks of geese were in evidence, flying low overhead; and at 7:30 the next morning the temperature was 44.

With only four or five days left in which to continue our operations, and with no sign of wolf on our old south line, we felt justified in its final abandonment, and picked up sets numbered 5 and 7. We still had in camp the camera released for use on our reconnaissance to Mack's Bayou. This gave us three cameras to play with. One was set as number 18 on the deer lick on Alligator Bayou, but brought in no deer—only a black squirrel in full flight. The other two were put out much nearer camp on the Alligator at points where the mud was well marked with fresh raccoon tracks, and numbered 19 and 20.

On these sets we used our fine wire trips, one wire passing through a loop in the other. Number 19 was finished at 4:05 P. M. and at 5:30 we heard a shot. A small 'coon had come along, but instead of traveling his regular runway, had been attracted by the bright silver aspect of the trip and apparently thought it needed thorough investigation. He turned towards the camera and must have been surprised at the explosive qualities of this attractive and harmless looking little object.

That was the only shot at this set, but number 20 kept us busy. We could see fresh 'coon tracks not only along the edge of the bank but on the muddy bottom of the bayou under water. To cover the situation properly, we placed both camera and lamp in the water. The trip was jammed up against the bank and the trip wire led into the water and anchored to a stake below the surface. It was not more than five hours after the completion of the arrangement when we heard the flash. In the soft mud, we found it hard to be certain whether or not there were tracks made since the camera had been set. But the wire was broken in two and that persuaded us that some animal must have walked through. It was a shock to develop a negative showing nothing but landscape.

Twice more this same thing happened. Then Sturgis figured out the cause. Mud in contact with both terminals of the trip, impregnated as it was with mineral, induced electrolysis. The part of the circuit most susceptible to this influence was the trip wire where it extended under water. Corrosion at that point broke the wire in a few hours. Thus the tension on the spring wire of the trip was released, permitting this wire to fly into contact with the other wire of the trip and shoot the flash. The defect was remedied by raising the anchor post so that the trip wire was no longer submerged. Thereafter, two reasonably good raccoon pictures resulted and one exasperating shot of a bird flying through the wire.

And now we realized that every day we delayed our departure we were rashly tempting the fates. The season of winter rains was already past due. The five miles of buckshot gumbo road between camp and the "front" must be carefully watched to insure the passage of our cars. Accordingly, plans were made to pick up all sets on November 1, pack them at leisure, and pull up stakes the next day. Here, however, the weather took a hand.

We awoke to the sound of thunder and the flash of lightning, and before we could get under way for the day's work, the heavy clouds opened up and for two or three hours poured hard rain upon the countryside. Now the mercury began to skid, and though the rain let up, the sky remained overcast and threatening. We dared not chance further delay. To gather in all the apparatus in the midst of rain and wet and mud, bring it to camp, break it down, clean it off, and pack it away was no easy matter. Once more number 13 had been fired, but development must await our return to civilization. A spikehorn buck had walked on the tread.

As we approached number 21, the farthest set from camp to the south, it boomed and flashed almost in our faces. This was the 36th shot,—the last of the trip—a veritable anti-climax, as it turned out to have been set off by the swaying of the trip wire in the high wind.

By four o'clock on the afternoon of November 1, the cars were loaded and we skidded and slithered out onto the concrete and away, with the sound of wolves, heard in the east early that morning, still ringing in our ears.

Program of Activities

of

The Chicago Academy of Sciences

Vol. 6

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No. 4



Photograph by A. M. Bailey

GRIZZLY BEARS OF THE YELLOWSTONE

Ursus horribilus imperator

The grizzly and brown bears are the largest of the carnivorous mammals found in North America. They have become exceedingly rare in many parts of their range, but this race is still numerous in the Yellowstone region, where it receives protection. It is not an unusual sight to see an old mother with her three young wandering along a trail, pausing now and then to uproot a decayed stump in search of food. They are omnivorous, being content with any sort of food, from vegetable to animal, that nature provides for them. Fierce but shy, the grizzlies are vanishing animals, and are in need of protection.

AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during this season in the Assembly Hall, Sundays, at 3:00 P.M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

November 3—Legend and Romance of the Northwest Indian C. J. Albrecht

The Indians of the Northwest coast are well known to Mr. Albrecht. He will tell of his natural history studies while living with these interesting people.

Illustrated

November 10—Plant Life of the Rockies

Dr. V. O. Graham

The plant life of western states is a varied one, and Dr. Graham, Scientific Governor of the Academy, will relate his recent experience while studying the flora of the region.

Illustrated with Slides

November 17—Through the Land of the King of Kings

Alfred M. Bailey

War in Ethiopia seems imminent, and so the subject is a timely one, and will bear repeating.

Illustrated

November 24—The Camera's Catch

Tappan Gregory

A leading exponent of photographing animals at night, Mr. Gregory, Honorary Curator of Mammals of the Academy, will show unusual pictures of large and small mammals; he will tell of the method employed, and his experiences while following this fascinating work.

Illustrated

December 1—The Colorado Rockies

Dr. Charles H. Behre

The formation of the mountain chain, the valleys, the growth of glaciers and the changing of river beds will be described by Dr. Behre, Geologist of Northwestern University.

Illustrated with Slides

December 8—Exploring Illinois with the Natural History Survey

Dr. Theodore H. Frison

The explorations of naturalists in our own state have resulted in interesting finds, and work of inestimable value has been accomplished by Dr. Frison, Director of the Survey, and his associates.

Illustrated

ROBERT KENNICOTT

1835-1866

By Donald Culross Peattie

By a striking coincidence the world of science this year celebrates the one hundred and fiftieth anniversary of the birth of the immortal Audubon, and the centenary of the birth of Robert Kennicott, one of the founders and the first director of the Chicago Academy of Sciences, the pioneer of Illinois natural history as well as that of Alaska, whose brilliant career terminated in his martyrdom to science at the age of thirty.

Robert Kennicott was born in New Orleans, November 13, 1835, the son of Dr. John Albert Kennicott, educator, physician, pomologist, and editor of *The Prairie Farmer*. The naturalist's mother was Mary Shutts Ransom of Buffalo.

When the child was one year old he was brought to Illinois, to a new-built log cabin at "Kennicott's Grove," a beautiful low ridge of land, crowned with gigantic burr oaks and shag-bark hickories, on the Milwaukee Road, between Niles and Wheeling; it is more precisely designated today as lying between the villages of Glenview and Desplaines.

As the child grew up, struggling with wretched health, his eyes, like those of many boys who make a bad physical start in life, were turned upon study and the significance of natural objects about him, instead of being extraverted toward bodily activity. With his father's guidance in scientific matters, young Bob, educating himself, took stock of the marvelous forest and prairie nature that, still largely virgin save for the loss of big game animals, stood, flew, cried, ran, nested, and rooted all about him.

Of the collections made by the enthusiastic child naturalist at "The Grove" and in the neighborhood of Chicago the present writer is preparing a brief memorial which it is hoped will see light a little later. Kennicott's life was so crowded with events, so packed with important geological discoveries, and my space here is so limited, that I must pass swiftly over his contact with the wild life of our own country-side here in northern Illinois. It is moving, however, to see a specimen of the vanished passenger pigeon, taken by the twenty-year old Kennicott here in "The Grove" where I write these words. His record of the turkey vulture was the first from this region, as were several others. Insects, reptiles, amphibians, mammals, mollusks—he let nothing escape his keen interest.

One who knew him well in his boyhood writes: "He often visited the city with little discoveries he had made and almost always called at the office of the writer. There would be a knock, the door would open, and he would begin to talk before he closed it, and talk his way up to the table and talk himself out of doors. It was a flower, a bug, a bird, a quadruped. He was full of plans to help others to see as he did. He bristled with facts. His mind was luxuriant. He had a love for natural science "passing the love of women." He read in concentric circles from his boyhood home farther and farther until he read the state of Illinois. He explored its Delta, that queer re-

gion with tropic traces, that is bounded by the Mississippi and the Ohio. He brought out its plants, caught its butterflies, unearthed its reptiles. No hardship was too severe if only he could add some coveted treasure to his cabinet. Slight in frame, he would be brave as a lion if anything for his darling science could be gained by it. What a companion he would have been for Audubon!

Before I continue let me acknowledge that most of what I have now to relate I owe to the memorial "Robert Kennicott" in Transactions of the Chicago Academy of Sciences, Vol. I, Part II, 1869.

The boy, before he was seventeen, had attracted the attention of learned men. His father sent him to Dr. Kirtland of Cleveland for study and to Dr. Hoy of Racine. This was all the direct training he ever received in the natural sciences; it was probably all he needed, with his powers of self-education. He would doubtless have worked under Agassiz had not every experience of close application to the desk shown that his nervous health was unable to endure it.

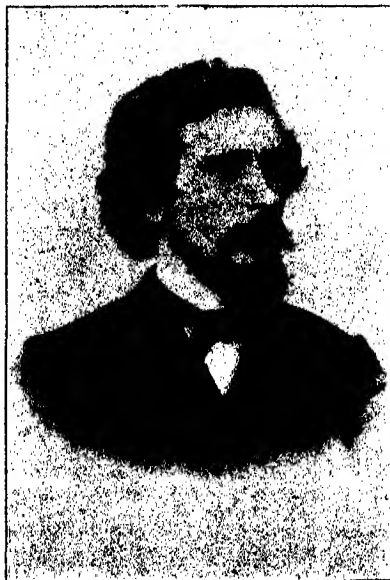
Before long Kennicott was called to the Smithsonian Institution in Washington, where he came under the influence of the giants of the day—Baird and Dall. Henceforward his specimens and his work were divided among the Smithsonian, the Chicago Academy of Sciences, and Northwestern University for which he formed a natural history museum.

Kennicott was an able systematist, naming the specimens of collectors from all parts of the country, notably the Trowbridge collection from California. But systematic work was not his real enthusiasm. He liked his animals best alive. Their habits and life histories, their conservation, their economic aspects—to know these things, he rightly judged, was the prime purpose of studying Nature. Identification was merely the learning of a specialized language in which to express ideas. His enthusiasm was simply boundless, and like all real scientists he had no jealousies. So far from wishing to keep other people from knowing what he knew, or reserving any special field to himself, he wanted everybody in on his favorite subjects, everybody working. His courtly manners, his liberal education and appreciation of arts and languages were traits rare amongst the run of scientists, and they lift him to the ranks of the great personalities—Audubon's, Linnaeus's, Darwin's, Haller's, and Humboldt's. His youth, his bubbling sense of fun, his tremendous energy made him the darling of his associates.

Kennicott, of course, was longing for new worlds to conquer. His health had improved enough to allow him to dream of far travel. At that time (*circa* 1859) the zoölogy of arctic North America was practically unknown. Nothing had been done there since the long-ago travels of Sir John Richardson and a few Russian and German reconnaissances of maritime Alaska. Not only was the fauna largely unknown and the mineralogy full of economic prospects, but from the point of view of pure science, it was essential that the meteorology of the arctic regions, from which our winter weather comes, should be better understood. The nesting places, the bridal plumage, the eggs and nests and mating habits, of many of our birds were totally un-

known, because the courting and reproductive phases transpired quite outside the limits of our country and of settled Canada. The ethnology and linguistics of the Alaskan Indian and of the Eskimo were almost unknown. Someone interested in all these things, and capable of studying them when he encountered them, was needed, and Kennicott was chosen as the man.

He had already had a taste of the lure of the arctic when he made his expedition to the Red River of the North, and reached a point farthest north at Pembina in the summer of 1857. The Hudson's Bay Company had then proposed to assist him, and so



Robert Kennicott

April 28, 1859, he set out from Chicago by the lake steamer *Fountain City*. His destination was Fort William, on Lake Superior, and I mention it only because I well recall my own brief hours there, and the feeling that impressed me that nothing then lay between me and the North Pole. I have been further north in latitude, but never in feeling.

In Hudson's Bay Company canoes he and his partner started for Lake Winnipeg. Like Linnaeus's immortal journey to Lapland, this great trek to the north outran the late arctic spring. Through melting ice jams, with the wild geese and swans flying overhead, Kennicott proceeded to Great Slave Lake, descended the Mackenzie amongst the migrating *foule* of the Caribou. With a capacity rare among Americans, he acquired languages wherever he passed, languages without a root in common with our own—Indian and Eskimo, and hybrid tongues without lexicons, the *lingoes* of the guides and trappers.

His journal is one of the most absorbing travel diaries that has ever come my

way. I regret that space permits me to quote almost none of it, but it is all there for the curious to read, in the Academy's memorial of his life. I cannot resist a reference, however, written from the desolate treeless tundra, and the monotonous spruce muskegs of La Pierre's House:

"I never fully knew how much I loved trees till I found myself made melancholy by thinking of the bonnie oaks and other trees I remember so well at "The Grove", while passing through some of these almost treeless wastes, or everlasting forests of spruce. I used to like evergreens best, but I fear the too constant view of spruces will give me a distaste for them. And oh! how I long to see even the bare branches and shaggy bark of the hickory. These wastes in winter look woefully desolate." The three years were spent in the arctic, a wealth of specimens collected, the identity of many controverted species established or disproved, the sources of the Yukon located, vocabularies of native languages prepared, and more facts upon mineralogy, climate, fur-bearing animals, and birds and ethnology amassed than even Linnaeus assembled in his Lapland report. In the spring of 1862 Kennicott received the first tidings of the Civil War in the States, and hastened home. He reached Chicago Oct. 17, 1862.

Relinquishing his first intention to go into the army, he very properly devoted himself to the career where, in war or peace, he could do the most good. He buried himself at the Smithsonian, working through his immense collections like a beaver.

There is a legend—it may be more—that Lincoln came to the Smithsonian and talked to Kennicott that winter, and that, listening to tales of the beauty and clean animal struggle of arctic life, the man of sorrows for an hour forgot the crushing weight upon him. (See "The Man of the Ages" by Honore Wilson Morrow).

The Western Union Telegraph Company in 1864 began to contemplate an overland telegraph to Alaska. A surveying party was formed and Kennicott was asked to join it as its naturalist. Kennicott sailed from New York at the beginning of 1865 for Greytown, Nicaragua, crossed the isthmus, and continued by boat to San Francisco and Sitka.

Red tape, wrangling, hampering economies levelled on the scientific branch of the expedition, and personal jealousies hindered the start for the interior. Kennicott's nervous vitality and his sensitivity to personal troubles reacted sharply on his system. Signs of prostration were seen. But at last, with the rank of major, he was ready with only ten men for penetration into the interior. However, the deficiencies of the equipment and the poor personnel hampered all work. All would have ended in failure but for the aid given by the Russian officials. His passport, written in Russian script, and stamped with the double eagle that is now a thing of history, lies before me on the desk as I write.

In May of 1866 some premonition of death was upon him. He wrote out directions for the conduct of the expedition "in case of any accident happening to me."

On May 13th, at Nulato, he passed out of the fort very early in the morning, spoke a greeting in Russian to a friend, and disappeared toward the beach. There, later, he was found lying at peace, beside him his compass, and indications for his map-

making of the surrounding mountains drawn in the soft soil. He had been at his loved labors when his heart suddenly failed.

The town of Kennecott (*sic*) in Alaska is named for him. "Fame," said Lord Byron, "consists in falling on the field of glory, and having your name spelled wrong in the dispatches."

A cross and tablet to his memory was erected by Dr. Dall on the spot where Kennicott died, aged exactly thirty and a half years. The news of his death did not reach "The Grove" until early in November of 1866. In that place, still the Kennicott family home, the tradition he inspired of loving interest in Nature persists, a green and living memorial.

FIELD WORK

The members of the staff have made field trips in various localities, collecting specimens and accessories for exhibits and study collections, and making photographs for our film library. Many vertebrates were taken and unusual photographs secured.

Florida

In the winter of 1935 there was found in central Florida one of the richest and most remarkable deposits of fossil shells ever discovered. It was visited soon after by Dr. Edmund Andrews, Vice President of the Academy, who in a short time was able to gather about 150 species of shells for our collections.

About a half million years ago (the State Geological Survey refuses to commit itself as to the age except within wide limits) this portion of Florida was under the sea at considerable depth. An elevation took place, the sea bottom of marl with its rich shell life was covered with a layer of fresh water deposits which hardened into limestone although the underlying deposits are not yet petrified. This is now buried under about 18 feet of recent marsh deposits from the everglades. The United States Government is engaged in building a dyke for flood control at Lake Okeechobee. The marsh accumulations are first cleared away, then the rock is blasted off and the deeper clay and shell deposits are lifted onto the huge dykes in steam shovels. This dyke is most easily accessible to a hard road near the town of Clewiston.

The entire dyke in this region consists of a mixture of hard clay and shell, the latter actually making up about a third of the material. Each new rain washes away a little more clay and hence exposes new shells. They are in a remarkably fine state of preservation, having been buried beyond wave action and protected by the rock layer, and often might be mistaken for fresh beach finds, even retaining their gloss and colors. About half of the species are exact counterparts of modern ones on the adjacent coasts. Most of the others have more or less close living representatives in the Caribbean, but quite a few are no longer represented in the entire region.

The sand dune region southeast of Kankakee proved of special interest and Messrs. Komarek and Necker made a rather extensive survey of the region, particularly in the sandy area near the Indiana line.

Several thousand feet of motion film were secured by A. M. Bailey and F. R. Dickinson through the cooperation of various organizations, especially the Illinois Natural History Survey, the Wisconsin Conservation Department, the Utah Fish and Game Commission, the U. S. Biological Survey, the National Park Service, and the Colorado Museum of Natural History.

Now that many species of birds and mammals are reaching the vanishing point, it seems especially desirable that records of the living animals be made, and we were fortunate in obtaining in our own state motion film of pinnated grouse upon their dancing grounds. The male prairie chickens gather on favorite strutting places each spring, where they go through their courtship antics for the benefit of the females. The magnificent males were photographed from blinds, and many "close-up" pictures secured.

A group of a dozen males was located in Cumberland County through the friendly cooperation of the Illinois Natural History Survey; the birds were performing on a bit of flat prairie country, no different apparently, from the surrounding region. We were informed by a farmer, that they had been using the same site for at least the last sixteen years.

The males came to the strutting grounds before daylight, flying to within one hundred yards, and then, in the greyness of the coming dawn, walk to their accustomed places. Each male has a little area of his own, the birds being spaced about thirty feet apart. They droop their wings and lower their heads as they strut about, the fan-shaped tail erect, and emit resonant booming notes as they swell orange-colored pouches on the sides of their necks. They often get together in pairs, charging fiercely, as though to tear each other apart, but we failed to see a feather disturbed. They would go up in the air like fighting cocks—but never touch! Other observers claim prairie chickens fight fiercely; it may be they do earlier in the season, but we did not observe a single combat. But when a female arrived at the trysting place, the actions of the males were entirely different. They had no time to eye each other. Instead each one seemed to get in the center of his particular claim, and with flapping wings, jumped a few feet from the ground, crowing in his eagerness to interest the invading lady. They did not pursue her. When one nonchalantly fed along the edge of the strutting grounds, the males remained in position, all facing her way and crowing their invitation, but they waited for her to show her preference.

Wisconsin

Similar studies were made of the sharp-tailed grouse in Wisconsin, through the aid of the late Frank J. W. Schmidt of the Conservation Department of that state. The sharp-tail performs in a different manner in his effort to secure a bride; like the prairie hen, the sharp-tail arrives on the performing area early in the morning, and

remains until well after sun up. The actions of the males of the two species are not unlike, so long as a female is not near, but when one arrives, there is little resemblance between the two. The sharp-tail holds his wings outstretched and his notes are so subdued that they can be heard only a short distance. Instead of a male carrying on a solitary performance, they act in unison, facing the female, with drooping wings out-thrust and head lowered. They stamp their feet and whirl about, making a rhythmic sound resembling the staccato firing of a machine gun, dancing together while one might count ten—and then stopping abruptly, each bird remaining motionless; then, in unison the dance starts again, the birds whirling rapidly, facing the female as she moves along. The action is so fast, and the performers move from the eye of the camera so rapidly that it is extremely difficult to make a satisfactory motion film.

Colorado

An excellent opportunity was offered to obtain pictures of the prairie falcon near Denver. Mr. R. J. Niedrach, of the Colorado Museum, had a nest located in a favorable site, a blind was anchored to the side of the cliff and studies were made of the adult as she brought in ground squirrels and fed them to her three young.

One of the most interesting of wild life projects is that carried on by the U. S. Biological Survey in the Bear River Marshes of Utah. The waters of the river have been flooded upon the lowlands instead of being allowed to reach the Great Salt Lake, and thousands upon thousands of water fowl are being attracted to the area. Mr. George Mushbach, Superintendent of the refuges of that western area kindly placed equipment at our disposal and, with the aid of Messrs. Mushbach and Hull, nesting pictures were secured of cinnamon teal, gadwall, pintail and red-head ducks, stilts, avocets, Brewster egrets, ibis, Franklin gulls, and Nevada song sparrows. On one little man-made island, one hundred yards long, in a man-made lake, we found three hundred and seventy-five nests of American avocets. Surely it was a sight to enthrall any lover of the out-of-doors.

With an Evinrude attached to a flat bottomed boat, we made our way to this little sanctuary, loaded down with photographic equipment. Hundreds of the long-legged, light colored avocets circled in the air, as they protested our invasion of the breeding colony. Strident voiced Forster terns, and the red-legged stilts joined the swarm of avocets, and as we waded ashore there was a scurrying of downy young of several species making for the nearest cover. One blind was erected, and from this we secured pictures of the avocets, stilts, and an old pintail duck as she settled on her nest. One of the fortunate shots showed an avocet changing nesting duty with its mate.

On another day, the marsh nesting birds were photographed as they carried on their household affairs. Solemn white-faced glossy ibis nested in colonies among the cat-tails and marsh plants, the beautiful Brewster's egrets fed their young for us, while we ground out film, and the black-headed Franklin gulls, nesting by hundreds in the low growths finally came to their nests and called their half grown young from places

of concealment. The Franklin and California gulls were the birds that saved the crops of the Mormons in 1848, when the hordes of crickets descended upon the fields. Immense flocks of gulls came from the marshes, and islands of Great Salt Lake, gorging themselves upon the swarming insects. The Mormons have religiously protected their benefactors, and have erected a monument to them, in the Temple grounds, in Salt Lake City.

The Utah Fish and Game Department also has a valuable project under way, near the north end of Great Salt Lake, which should prove of benefit to our breeding wild fowl. It was through the cooperation of Newell B. Cook, Commissioner, that we were enabled to make a survey of the pelican colonies of Great Salt Lake. Mr. Lee Kay, in charge of the educational services of the department, had visited Hat Island, and found that the pelican colony which has been there as long as man remembers, was abandoned this year, so we endeavored to locate the missing birds. By means of trailer, flat-bottomed boat, and portable motors, Gunnison Island was reached, and a large colony of pelicans was found and photographed.

When Captain Stansbury explored Great Salt Lake in 1850, he landed upon Gunnison Island on May 7, and his description of the breeding colony of pelicans could have been written today, for we saw no changes. Stansbury wrote: "There are two islands here, one of them quite small, and lying within one hundred yards to the northward of the larger one, of which it has at one time formed a part. We landed at the head of a beautiful little sandy bay, on the eastern side, which has its counterpart on the western, the two being separated by a low, narrow neck of land, forming a delightful little nook, and separating the lofty pile of rock forming the northern part of the island from the rocky cliffs which extend to its southern extremity.

"The whole neck and the shores on both of the little bays were occupied by immense flocks of pelicans and gulls, disturbed now for the first time, probably, by the intrusion of man. They literally darkened the air as they rose upon the wing, and hovering over our heads, caused the surrounding rocks to re-echo with their discordant screams. The ground was thickly strewn with their nests, of which there must have been some thousands. Numerous young, unfledged pelicans, were found in the nests on the ground, and hundreds half-grown, huddled together in groups near the water, while the old ones retired to a long line of sand-beach on the southern side of the bay, where they stood drawn up, like Prussian soldiers, in ranks three or four deep, for hours together, apparently without motion."

Commissioner N. B. Cook accompanied the party, a few days later, to Utah Lake, the largest fresh water lake in the state, where a marvelous colony of California gulls breed.

Yellowstone Park

The Yellowstone National Park will be depicted in film for our school use and a preliminary survey was made during the summer. The Park with its scenic wonders and abundant wild life serves as an outdoor laboratory for thousands of visitors each year, but for each visitor who has this opportunity, there are many thousands who are

destined to remain at home. With our film we will be able to be of service to many. Mr. Roger Toll, Superintendent of the Park, advised us of favorable places to work, and photographs of cinnamon, black, and grizzly bear, Shiras moose, elk, and antelope were secured. The Yellowstone region is one of the most interesting in all North America with its mountains, wooded hills, lakes, rivers, hot springs, and geysers, and its abundance of wild life. The trumpeter swan still nests along the borders of reed grown lakes; beaver have built a myriad of dams and have flooded areas in which the willows have grown—making cover for the ungainly moose. Antelope feed on open hillsides and black and cinnamon bears pan-handle food from tourists. One of the greatest object lessons in conservation is the way in which the shy and dangerous grizzly bears have been persuaded to forget their natural fear of man; they come each evening to a feeding place—thirty or more assembled in a group—always alert and suspicious, while hundreds of spectators watch from a nearby, protected hillside. And strangely enough, the bears seem to fear their own kind, more than the people, for they continually watch the woods behind them, scenting the air for danger, and when an unusually large fellow makes his appearance, the others withdraw until his majesty has satisfied his hunger. The bears of Yellowstone are but a remnant of those that once roamed our great west—the others are doomed to extinction—but here, we hope, we will have them for all time.

A. M. B.

PUBLICATIONS

The Academy has resumed publishing the Bulletin, which was discontinued over twenty years ago. The Atwood Celestial Sphere was the title of Number two of Volume four, which appeared in May 1913. Three numbers have so far been published of Volume five under the following titles:

Contribution to the Herpetology of the Smoky Mountains of Tennessee.

By Walter L. Necker.

Supplement to an Annotated Flora of the Chicago Area by H. S. Pepoon.

By Carl A. Buhl.

The Birds of Kodiak Island, Alaska. By Herbert Friedmann.

As the majority of the papers to be published will be of a technical nature, and the editions will be limited, they will not be sent to members unless especially requested as issued.

CHARLES DICKINSON

Charles Dickinson, who has been associated with Academy work for nearly half a century, passed away in New York City on September 2. He was Vice-president of the Board of Trustees for the past twenty years.

Accompanying this number of the Program is a memorial in recognition, in a small way, of this pioneer so beloved by his associates. He is survived by his sister, Dr. Frances Dickinson, also a Trustee of the Academy.



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of the Chicago Academy of Sciences)

EVENING LECTURES

John James Audubon

One hundred and fifty years have passed since the birth of Audubon, the naturalist. The Academy and the Illinois Audubon Society will have a joint meeting on Thursday evening, October 10, at 8:15 P.M. in the lecture hall, to hear Mr. Donald Peattie, naturalist and author, who will speak on Audubon and tell of his travels and his work. At the conclusion of Mr. Peattie's talk, Mr. A. M. Bailey will show a few of the Academy's motion films which were made "Along Audubon's Labrador."

Members of the Academy will be interested in reading Mr. Donald Peattie's *Singing in the Wilderness: A Salute to John James Audubon*. It is published by Putnam's and contains six reproductions of Audubon's paintings as well as an hitherto unknown portrait of Audubon as a young man, painted by himself. A copy of this excellent book may be examined at the Academy.

Robert Kennicott

The one hundredth anniversary of the birth of Robert Kennicott, naturalist and first director of The Chicago Academy of Sciences, falls on Wednesday, November 13, of this year. The Kennicott Club will hold an open memorial meeting on that date, in the Academy lecture hall at 8:15 P.M. and Mr. Karl Schmidt of the Field Museum will speak on the work of the Naturalist, and of his contribution to the fauna of our region. The lecture will be illustrated. Members of the Academy and affiliated societies are invited to attend, and bring their friends.

JOHN JAMES AUDUBON

1785-1851

By Donald Culross Peattie

In far-off, dark green and turbulent Haiti, on the morning of April 26, 1785, was born in a great, shuttered plantation house at Les Cayes, the child who was to become John James Audubon. The "little rainy season" had already begun when Dr. Sanson rode through the jungle to the indigo, sugar, and tobacco plantation of rich and roving Captain Jean Audubon, to attend there, Mlle. Rabin, in her difficult hour. The gorgeous trogons had taken shelter under the palm fronds, and the little sugar birds came right into the room, hopping about on the furniture, picking up insects. Already the sweltering heat of a tropical spring was on the land. Haiti, too, was near its boiling point, when the blacks would rise up in their just and savage anger. The woman in pain was not a year away from the grave. The Captain, exiled in a tropic land from his wife Anne, back in Christian France, was reaping, as he may have thought, the harvest of his sins and follies. Under such dark auguries was born this child of destiny, this sunny and golden temperament, this passionate American.

It was disconcerting to many patriotic Americans, and to Louisianians in particular, to learn in 1917 that such were the circumstances of Audubon's birth. There is an Audubon Park, the pride of New Orleans, with a statue to Audubon in it, and not one but several houses in the Pelican state where the future painter of birds is supposed to have seen the light. But the careful detective work of Audubon's best biographer, Dr. Francis Hobart Herrick, has left no scrap of the mystery surrounding the ornithologist's birth which Audubon himself was so careful to cultivate. He told many and conflicting stories of his birthplace, his mother, and even of his father, and to the world he asserted that he himself could not place his birth within four or five years. So it was that the centennial of his birth passed unhonored in 1885. This year we are celebrating his sesquicentennial not because "sesquis" are naturally very significant or exciting, but because few of us care to chance it and wait until 1985 before throwing up our caps and shouting hurrah for John James, the best loved man in American ornithology.

When Captain Audubon arrived in Nantes with a four-year old boy named Fougère Rabin and a two-year old girl by still another woman, he must have been prepared to do a deal of explaining to honest and virtuous Anne, his wife. Even for a sailor it was a stiff yarn to have to spin. But Anne Moynet, older than her husband, and childless, took the two little waifs, washed to her across tropic seas, into her arms and loved them as her own. The children were first adopted, and given the name of Audubon, and then baptized, and had Christian names bestowed upon them. "Jean Jacques" fell to the boy's lot—John James, as it was to become some twenty-five years later, in Kentucky's wilderness, when a life, undreamed of in Nantes, should claim him.

The childhood of the little Jean Jacques passed, in the winter months, in gabled Nantes, where he learned to know the rooks and jacksnaws, magpies and starlings of an old European town. In the summer the family removed a little way down the

reedy estuary of the Loire, to the estate of La Gerbetière, one of those French country houses of the eighteenth century where the seas of grain rolled right to the walls surrounding the formal garden with its orangery, and where one passes from complete rusticity into the stiff but sweet interior, with its crystal chandelier, its spinnet, its mountainous goose-feather beds and rich cooking. Here the boy grew up as a child of wealth, and a very handsome and spoiled one, whose tiresome old mathematics and English lessons were but painful interruptions to a life divided between the village sweet shop and passionate bird hunting. There were tuneful blackbirds in the garden, piping chaffinches, wrens chattering beneath the eaves, saucy wagtails in the prim garden walks, and swallows wheeling with the pigeons, over the barn roof. The nightingale, in its summer breeding range, just reaches that eastern edge of Brittany, and the redstart builds there. Down on the tidal flats the curlews skimmed, the redshanks walked on stilted limbs, the night herons and water-hens and bitterns dwelt, and the little reed warblers nested. From out the woods, in spring, came the soft, monotonous call of the Old World cuckoo, as life-like as a cuckoo clock!

In this world of birds—for the child was scarcely aware of any other—Jean Jacques grew up, and his bird-nesting, egg-collecting, and skylarking, would have passed as a phase, along with other puerile vices like boasting, gluttony, indolence, and playing hookey, had he not already begun to be a little artist. A few months training, when he was seventeen, in the studio of the great, the cold, the academic David in Paris, seem to have been wasted on him. He did not want to copy classical models. He only wanted to paint birds. No need to say that this child was the despair of his sensible father, a man of action and of business.

For lack of anything better to do with him, Captain Audubon packed the twenty-year old lad off to America. Jean Jacques arrived in New York in 1803 and proceeded to his father's property, "Mill Grove" on Perkioming Creek, a tributary of the Schuylkill, near Philadelphia. And here he astonished the grouse as much as his sober Quaker neighbors, by going hunting in black satin breeches, ruffled shirt, silk stockings and pumps. This court ballroom figure was made odder still by his long flowing hair, which fell to his shoulders, and his peculiarly fresh and rosy complexion.

Some who associate the name of the Audubon societies with an almost fanatical bird protection, have winced at the discovery that Audubon was for the first thirty years or more of his life an ardent sportsman. It is only fair to judge him in the light of his times, however, for his upbringing had been that of a "gentleman" as it was then conceived. Nor was there anything like the same necessity for the conservation of wild life in Audubon's day, as in ours. Audubon was an old man before the diminution in our bird life became apparent, and when it was so, this hero of ornithology became an ardent conservationist. The fact remains that he did not believe that the passenger pigeon would ever become extinct, and that in his youth he shot as many grouse and squirrels and cougars as the next backwoodsman.

But it is to his hunting that he owed the greatest luck of his life. For while out for the grouse, in the autumn of 1804 he fell in with his neighbor Mr. Bakewell, was

invited to his house, and there met the fifteen-year old Lucy with whom he promptly fell in love. She too was the spoiled darling of a home of wealth and breeding, but through all the hard years to come Lucy proved herself both a woman and a lady. While her John was off bird-gazing weeks upon end, yes, even months and years, when John failed in business (as he repeatedly did) when John wanted to publish the most expensive ornithological work ever heard of, it was Lucy who supported herself and her children, Lucy who faced the neighbors (and you can imagine what they had to say, in pioneer America, of that feckless, dressed-up, artistic, foreign husband of hers) and Lucy who believed in the impossible dream that became *The Birds of America*. Of all the heroines of American history, Lucy Audubon stands out, for me, as the foremost. Carrying water once to wounded soldiers, under fire, is easy and morally simple, compared to the courage and grit of this woman who went from a manor house to a rude log cabin in Kentucky and lived through all the hardships of the pioneer woman while she faced the scorn of the herd.

We have to reconstruct a vanished scene to see the Middle West as it was in 1808 when the young Audubons made their wedding journey in an ark down the Ohio. The river then was choked with wild ducks, geese, whistling swans, and cormorants. From the forest, crowding to the river banks, rang out the cries, the songs, the screams, the calls, the hammering and drilling, of a wilderness of birds, an untouched Eden wherein, as before the creation of Adam, the wild creatures that prowled there in the ferocity of their primaeval innocence, were not even named. Across the sky the passenger pigeons sped, at sixty miles an hour, in an arc that reached from horizon to horizon, and lasted from sunset to dawn. In the bur-choked clearings the Carolina parrots rasped and clawed and screamed. In our day and age when not a single new species of bird has been found in the eastern United States for many years, nor likely ever will be, any naturalist-adventurer can envy John James, as he neglects the dingy old store where he ought to be selling tea, whisky, calico, and gunpowder, and shoulders his gun to march off through the canebrakes or the cypresses or oaks or beeches.

But Audubon, in the early part of his life, was no systematist. He was scarcely a scientist at all. It takes a strong mental effort to realize that the most honored of all our ornithologists was, most of his life, an artist at heart. He had a wretched memory for facts and often got into hot water with sober-sided and exact naturalists, by his inaccuracies. He was vain, both about himself and his work—a quality essential, no doubt to an artist, but a blemish in the career of a scientist. He was mercurial, easily elated, swiftly depressed, took criticism personally, had an ebullient, talkative, generous character, wore his heart on his sleeve and did just about everything that in the business world (where he failed so dismally) and in the pedantic world where he aspired to enter, is completely taboo.

But whatever he was, Audubon was not ruled by the herd. In the backwoods he was an eccentric, a foreigner, a queer wandering artist-fellow. In staid Philadelphia, academic Edinburgh, chill London, and proud Paris, he was a backwoodsman, with-

out family or scholarly standing. But in the end Audubon's personality conquered, by virtue simply of being so irrepressibly, so naively and gaily what it was. He was absolutely unique; no one else was ever remotely like him. Whatever else he was, he was lovable.

Some stories, though so often told, are too good not to relate once more, and many Audubon incidents are like Lincoln stories—our hearers have generally heard them before, but we must still recount them for the chuckle or the wisdom or the moral vistas in them, for they bring out the best in ourselves. I am thinking particularly of the famous meeting between Alexander Wilson and Audubon, when the grave, ill-fated little weaver of Paisley and dominie of Pennsylvania, walked into Audubon's store at Henderson, wishing to sell him a subscription (priced \$120) to his *American Ornithology*. These two founders of American ornithology had never heard of each other, and great was their mutual surprise. Great too, but covert, their jealousy. Audubon says that he was on the point of subscribing when his partner said in French that his (Audubon's) own drawings were so much better that it was foolish to expend money on this stranger's work. Wilson either understood French, or he understood facial expressions, and out of that unlikely meeting in the Kentucky backwoods sprang a rivalry that is still sometimes stirred today. Charges of plagiarism, of machinations, and of nature faking, were fostered, not only by the backwoods Frenchman and the Scot made even more rigid by Philadelphia, but perpetuated by their partizans. The puckish, artistic Audubon, the humorless Wilson, pinched by a hard life, these two were not meant to love each other! But we, today, may honor them both, for their work was complementary.

There is no space to tell of all Audubon's wanderings—to the dark bayous of Louisiana where the aningas eyed him, to Florida, land of the egret, to the gannet-haunted bird rocks of the Gaspé, to Fort Laramie far up the Missouri, and to Europe to assault a cold, self-satisfied, old civilization and wring from its grudging hands a thunder of applause, and a shower of pounds and golden louis for the subscription to *The Birds of America*. I cannot tell how, once Europe had accepted him, America was proud to know him, after giving him a great deal of contemptuous and uncivil treatment. All this is part of history and there are many places where one may read of it.

I would speak rather of his stupendous achievement, the elephant folio five volumes of *The Birds of America*, wherein every creature, be it an eagle, a vulture or a flamingo, must be represented life size. To realize what Audubon did for bird painting we must remember that before his time all ornithological illustration was drawn from stuffed birds on artificial twigs. Audubon shocked museum men, and pedants generally, by showing his birds in action, on the wing, fighting, screaming, tearing open ears of corn, ripping the head from a fish, hunting lice under their wings, sheltering their heads against a blast of bitter wind. He represented his birds in perspective, even tilting or blown up-side-down. It was Audubon's contention that the natural lustre of bird plumage begins to fade soon after the bird is killed. He began his paintings as

soon as he had winged his specimen, therefore, and would work as much as sixteen hours without stopping, in order to capture the glory of a hummingbird, a teal, or an oriole.

I do not say that there might not be, that there are not, better scientific drawings. It is easy for a later century to improve on the work of an earlier. But I maintain that the Audubon vitality, the Audubon perspective, the Audubon natural habitat—the Audubon touch, in short—are discoveries original to him which are employed today by Brooks and Fuertes, Benson, and Brasher. When first one opens the great elephant folio volumes—the life achievement of a great man—one feels that he has gone back to an Old Master. And that an era now vanished, a paradise of birds, is made to live again.

SIGHT RECORDS OF THE HORNED GREBE AND MOURNING WARBLER

By Frank A. Pitelka

Returning from a walk early in the evening of July 14th, about a quarter of a mile from LaGrange Park, along the trail north of the Salt Creek, I was stopped by a strange song, which I suspected to be that of some warbler.

Following it to a hawthorn at the edge of the creek, my attention was suddenly distracted by a bird swimming about in the creek, which at this point curved, cutting the wooded bank on the south side and leaving somewhat of a cove and a muddy stretch frequented by sandpipers on the north side. It was a horned grebe. At first, seeing it at some distance, I thought that the eyes and lores appeared bloody, that perhaps the bird was blind—a possibility for this out-of-season presence. But upon closer observation this thought was laid aside, for its beady eyes were the color of red ink. The bird watched my every move and governed itself accordingly. I approached within 25 feet of it and was able to study it with 8-power glasses in both sunlight and shade. Its buff tufts behind the eyes were quite dingy and worn. The chestnut on the front of the neck was brightest. Throughout my observation I caught no sign of injury, and later in the evening I saw it feed. It dove twice—wings closed. Most of the time, however, it merely stuck its head under the water, paddled around, and searched. Monday morning (15th) I returned to find it still there. But here in the muddy salt creek, life for a grebe is just a game of hide and seek with an occasional bullhead, so on Wednesday (17th) when I visited the spot for the third time, it was gone. This observation remained unwitnessed despite my efforts to have it shared with some one of authority during each of the two visits.

After watching the grebe for some time on the 14th, the strange song mentioned in the first paragraph came again from a nearby hawthorn at the edge of the creek. Finding the songster and putting my glasses on it, I was surprised to see a mourning warbler and recognized the first part of the song as that which I had heard before in the late spring. Upon my closer approach, it flew down into the undergrowth, but

remained in plain view for some moments about 15 feet away. My 8-power glasses brought it much closer to me—an adult male mourning warbler—gray-headed with black about the lores and eyes and on the upper breast. It flew up into a second hawthorn farther away and entered into a fight with another small bird. As the pair, chasing each other, flew to the other side of the creek, the rasping call-note of a young cowbird came from the same place in the hawthorn where I first found the warbler singing. It soon took wing, followed the fighting pair, and then continued back to my side of the creek into a clump of willows a short distance up the creek. Immediately, the two warblers—(I take the second bird to have been the female of the pair, but I never saw it closely enough to identify it as such)—the two warblers followed the cowbird as if to see that it landed properly. They then resumed their fight, returning to the other side. At this time the other small bird, in all probability the female, disappeared, and I saw it no more. I moved towards the willows during which time the male must have returned to the young cowbird. As I stood under the willows, hearing the cowbird and hoping to catch a glimpse of the warbler actually feeding it, which I never did, the male warbler flew out from the willow into a basswood on the other side of the creek, where it sang again.

Monday morning (15th) I found the warbler on the south side of the creek, singing on a dry branch of a basswood. At times it sang with food in its mouth. The food was carried to a crabapple thicket some distance away from the creek, where, no doubt, its foster child, insisting upon more food, was one of the several cowbirds I heard from there. Close by were song sparrows and a towhee, each, without question, having a cowbird to stuff. Wednesday evening I visited the spot again and heard the warbler. Thursday morning, I was able to show my discovery to Mr. A. M. Bailey. The warbler sang periodically throughout our visit. It moved rather frequently and after several glimpses, caught as we followed it about, we saw it best up in a dry tree where it sang with food in its bill. Saturday morning (20th) it was still there.

The warbler always sang from a high point, preferably a dry branch, where it would pass through periods of quiet repose alternated with song periods during which it moved about. The song itself fits no interpretation given in Forbush's *Birds of Massachusetts* but approaches most closely that of Lynds Jones, who records it as "tee-teo-teo-teo-we-se, last couplet accented and much higher pitched." From my notes for May 28, 1933, I record the song as "rather loud and outstanding midst the other songs, a warble consisting of seven notes and beginning and ending with the odd notes, the even notes being lower and all the same: — — — — ." This can readily be interpreted as "tee te-o' te-o' te-o'," and is the same as that sung by this bird, except that instead of the last couplet added to the interpretation of Lynds Jones, this song was completed by two additional *te-o'* couplets, similar in quality of tone and volume to the others, but both of a lower pitch.

Occasionally variations occurred in the number of syllables. It was a clear, rather far-carrying warble, equal in quality of tone and volume to that of the Maryland yellowthroat.

The area, which the warbler occupied as its summer home, was situated along the Salt Creek, the south side in particular, a quarter of a mile from LaGrange Park. There was an open space covered with a growth about four feet high with an abundance of blackberry tangle and small hawthorns. Along the creek side of this space grew ashes, oaks, and some basswoods, with tall ragweed for undergrowth. On the other, the south side, were oaks mixed with medium-sized hawthorns. The dry branches of the living trees and the dead trees scattered here and there seemed to be preferred by the warbler as perches for singing.

To my knowledge there are no July records for either of the above species for our area. According to the *Birds of the Chicago Region*, compiled by Messrs. Ford, Sanborn, and Coursen, for the grebe May 30 is the latest spring date and Sept. 6 the earliest autumn date, with a record of downy young taken in Lake County, Indiana, May 24, 1878 (Butler, 1897). For the mourning warbler, June 8 and August 17 are the latest spring and earliest autumn dates respectively with no records of breeding. Both are birds of the Canadian zone and belong perhaps several hundred miles to the north. I sincerely regret not having had the presence of the grebe witnessed, but I am indebted to Mr. Bailey for his confirmation of the warbler record.

CHRISTMAS CENSUS

It is now time to be making plans for the Annual Christmas Bird Census. A fine list of reports was submitted last season, and it is hoped that many new observers will take the field during the holidays. We desire to have as many counties represented as possible. Please use Field Cards to submit lists (available, post-paid, ten cents a dozen, at the Academy) so the reports will be uniform. If reports are for several field jaunts over the same ground during the holidays, give dates and conditions separately as usual—but list all birds on one card—giving the highest total for each species for one day's observation. For instance, if ten jays are seen one day and twelve the next, list twelve and not twenty-two. We desire the lists conservative. In a separate note, report in the following sequence the nearest town, the county, the itinerary, the date, and weather conditions. With the cooperation of all out-door enthusiasts, valuable data will be assembled.

Copy for the Annual Bulletin should also be prepared and sent to the Audubon Office at the Academy by January first.

Program of Activities

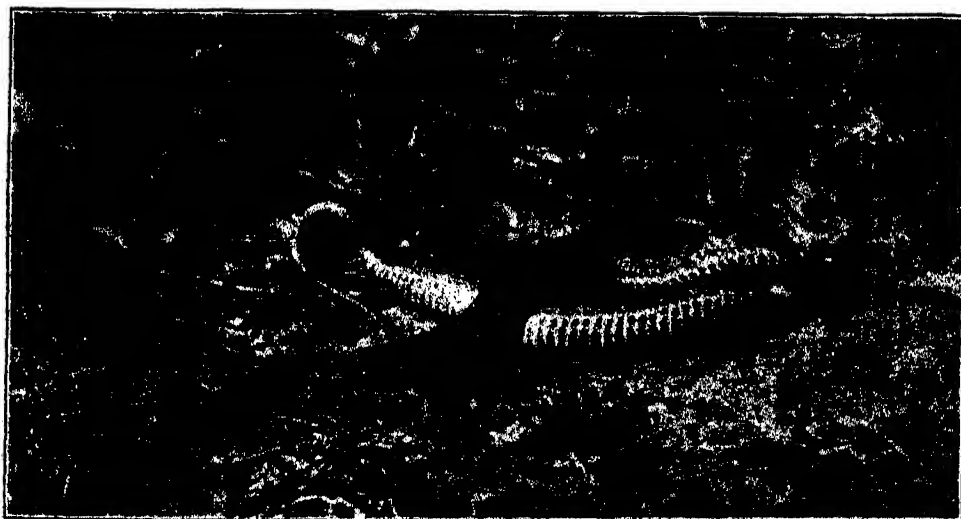
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No. 1



Photograph used through the courtesy of Roger Conant, Philadelphia Zoological Society

KIRTLAND'S WATER SNAKE

Natrix kirtlandii

This water snake is the first of over twenty species of snakes described by Robert Kennicott, and was named for Doctor Jared Potter Kirtland who probably gave young Kennicott his first interest in the scientific pursuit of Natural History. Kirtland's water snake is found in Illinois, Michigan, Indiana, Ohio, and Pennsylvania, but is extremely rare in the Chicago Region. It is one of the most handsomely colored of our American water snakes, and is easily distinguished from all others by its brick-red belly. Like all water snakes it is harmless, although when attacked it will defend itself, striking vigorously.

WINTER PROGRAM OF ILLUSTRATED LECTURES

The Academy announces a series of free public lectures during this season in the Assembly Hall, Sundays, at 3:00 P.M. The doors will be closed at three o'clock, or before, if the hall is filled, but members will be admitted.

January 26—Mexico

Dr. Harold W. Kent

Our southern neighbor, a land of contrasts, will be presented from various angles by an experienced traveller. The archeology of different areas will be discussed with special emphasis upon the Mexico of the tourist.

Illustrated with Slides and Motion Film

February 2—American Wonderlands

Dr. Louis J. Tint

Highlights of American scenery, waterfalls, mountains and plains, and beautiful flowering plants in natural color will be used to illustrate Dr. Tint's lecture.

Illustrated with Slides in Natural Color

February 9—"Behind the Veil"—India and Kashmir

Mrs. Barnum Brown

An illustrated journey through India, Kashmir, and Burma with glimpses of the splendor of ancient art, of the incomparable Taj Mahal by moonlight, of Benares, Sacred City of the Hindus, and of strange primitive people.

Illustrated

February 16—Wilderness Remnants

Dr. Warren G. Waterman

The passing of the seasons in the beautiful wilderness remnants of our own region, adjacent to Lake Michigan—dunes, forests and rivers and lakes will be portrayed in natural color. The speaker is Head of the Department of Botany at Northwestern University.

Illustrated with Slides in Natural Color

February 23—Travellers of the Sky Trails

Mr. W. I. Lyon

Marvellous migrations of birds as recorded by banded specimens—the return of individuals over hundreds of miles of sky trails will be told by the foremost bird bander of the country.

Illustrated

March 1—"One Star Differeth from Another in Glory"

Dr. Oliver J. Lee

Most remarkable advances have been made in recent years in the study of Astronomy, the oldest of Sciences. The lecturer is Professor of Astronomy and Director of the Dearborn Observatory of Northwestern University.

Illustrated

March 8—Happy Hunting Grounds of the Geologist

Dr. J. R. Ball

The Upper Mississippi Valley is an ideal hunting ground of the geologist. During the past year Dr. J. R. Ball, Honorary Curator of Palaeontology of the Academy, worked the region under a special grant from Northwestern University.

Illustrated

ROBERT KENNICOTT, FOUNDER OF MUSEUMS

By KARL P. SCHMIDT

Address before the Kennicott Club at the Chicago Academy of Sciences, November 12, 1935,
on the occasion of the hundredth anniversary of Kennicott's birth

There are others in this city who might better have been called upon to speak on this occasion on the hundredth anniversary of the birth of Robert Kennicott, among whom I would like to name my own chief, Dr. Wilfred Hudson Osgood, whom I regard as the first naturalist of our city, as Kennicott was in his day, and whose researches in Alaska did so much to carry on Kennicott's interest in the zoology of the arctic region; and I might name Mr. Alfred M. Bailey, who now holds the very position as Director of the Chicago Academy of Sciences, which Kennicott once filled, and who shares with him and with Dr. Osgood the experience of Alaskan field work. There is too, Mr. Donald Culross Peattie, who is related by marriage to Kennicott and whose fine tribute to Audubon, recently published, shows him as a sensitive interpreter of the personality of a naturalist. I nevertheless am glad that the choice fell to me, for I have long been interested in Kennicott; I believe it was I who suggested that our association of working naturalists in Chicago be named the Kennicott Club; I do myself pursue one of his principal fields of interest in the study of reptiles; and I am native to this same Chicago region in which he passed his youth and in which he made his mark as a naturalist and as a founder of museums. Most of all I would like to resurrect for you some touch of the charm of Kennicott's enthusiasm which so shines in his letters to Baird and to his friends in the North. And I believe that too few Chicagoans know of him and appreciate his place in our history, or realize that the tragedy of his, far off death affects our own lives to this day. I know too that there is no other person in this room who so deeply feels and so inescapably knows the tragedy of the death of a young naturalist at the threshold of a great career. I wish first to remind you of what Kennicott is remembered for, of what he did accomplish in his short life; second I wish to venture a comparison of him with the two great founders of museums of natural history in America, Louis Agassiz and Spencer Fullerton Baird; and lastly I will attempt to point out to you some of the inevitable consequences of his tragic death in 1866.

Kennicott introduces a long letter home from the North with an account of "Rubbaboo," the voyageurs' soup made from pemmican.

Rubba' oo consists simply of pemmican made into a kind of soup by boiling in water. Flour is added when it can be obtained, and it is generally considered more palatable with a little sugar. Pemmican is supposed by the benighted world outside to consist only of pounded meat and grease; an egregious error; for, from some experience on the subject, I am authorized to state that hair, sticks, bark, spruce leaves, stones, sand, etc., enter into its composition, often quite largely, especially if the meat has been pounded by the Indians. Rubbaboo is made in open kettles, of snow water. I was a little shy of it for a while, after learning how the two packet men were once made into pemmican near Fort Good Hope, a few years since, by starving Indians.

Having described rubbaboo, I must now tell why I call these writings a Rubbaboo Journal. Any queer mixture gets that name among the voyageurs. When I try to speak French, and mix English, Slavy and Louchioux words with it, they tell me "that's a rubbaboo." And when the Indians attempt to sing a voyaging song, the different keys and tunes make a "rubbaboo." In short, what outsiders would call an olla podrida, jumble, etc., is here aptly termed a rubbaboo.

In my remarks which follow I have drawn on the writings of better men than myself for opinions on Agassiz and Baird; and my address will in fact compose a "Rub-

baboo" in which I fear my own share will correspond to the sticks and stones and leaves, while William James and C. Hart Merriam supply the meat.

Robert Kennicott was born a hundred years ago on this day in November, in New Orleans. Within a short time his parents moved to this region and settled at the homestead near Wheeling, northwest of Chicago, which is still in the possession of their descendants and which is still known as "The Grove." Here he grew up, a frail child, with little formal schooling, but with the good fortune of association with his father, who was notable both as a physician and as a horticulturist, and so also with a wide acquaintance of his parents' friends, who included most of the intellectual leaders of the community. This very freedom from formal schooling, with its encouragement of time spent in the woods and on the prairies and marshes, shaped his interest in natural history. Then as now, the best way to become a naturalist was to acquire the unselfish interest in the external world from some other naturalist; for this kind of enthusiasm is often contagious in the extreme. Whatever may have been the signs of promise in his childhood, his parents recognized them, and sent him to study at the age of seventeen with a family friend, Dr. Jared Potter Kirtland, of Cleveland, who like Dr. Kennicott was both physician and horticulturist, and who added to these interests a genuine command of descriptive natural history. Kirtland left a permanent mark on the history of natural science in Ohio in his work on mollusks and on fishes, and equally by his furtherance of popular interest in the fields of science in general and of scientific agriculture, on which he wrote voluminously in his own weekly and in the "Ohio Farmer." Kirtland, like the Kennicotts, was profoundly a democrat, his feet planted firmly on the soil, as those of a physician and horticulturist are so sure to be.

Kirtland introduced Robert Kennicott to Spencer Fullerton Baird, who was then already actively engaged in promoting the work of the Smithsonian Institution in natural history, and was embarked upon his vast plans for the zoological exploration of America. In the year following, Kennicott made the first of a series of visits to another naturalist-physician of note, Dr. P. R. Hoy, of near-by Racine. With the stimulus thus gained, and trained by these men in the fundamental technique of museum collecting, Kennicott began collecting in the Chicago region, and soon made himself the acknowledged authority on its animal life. I have felt some obligation myself, in the midst of a multitude of other interests, to carry on at least some studies in our local region, and have lately published with my friend Walter L. Necker of this museum a list of our local reptiles, the first since that of Kennicott, eighty years ago. The emphasis of the Academy on studies in this local field seems to me to be most appropriate. Certainly one of the best approaches to Natural History is to begin at home, as Agassiz did in Switzerland, as Baird did at Carlisle, and as Kennicott did in the Chicago area. In 1855 he published his first scientific paper, a list of the vertebrates and mollusks of the Chicago Region. What appears to be his first description of a new species, published in 1856 in the Proceedings of the Academy of Natural Sciences of Philadelphia, is the description of the beautiful small water-snake native to our Chicago region, which he named *Natrix kirtlandii*, in honor of Dr. Kirtland. At the advice of his friends, he gave up all plans for the pursuit of more formal education, for every attempt at attendance to medical lectures had ended in illness.

In 1855 he went to southern Illinois to collect specimens for the State Natural History Survey, under the joint auspices of the State Agricultural Society and of the Illinois Central Railroad.

The Chicago Academy of Sciences was founded in 1856, and the twenty-one year old Kennicott was actively enlisted in work and plans for its museum. In this year he was commissioned to write a report on the mammals of the Northwest in their relation to agriculture, for publication in a government report. In the following year,

(1857) he undertook the organization of a museum of natural history at Northwestern University, under the direction of Dr. Evans, and made his second collecting trip to southern Illinois in the spring of 1857 to collect for the university. At Anna, Jonesboro, Cairo, Salem, and New Madrid, he made large collections, especially of reptiles, and established himself securely as the first Illinois herpetologist. Returning to Evanston by July, he deposited his material there and set out for the Northwest, to supplement these southern collections with others from a widely different region. He spent the late summer and early fall at Pembina, on the Red River of the North, near the Canadian border.

On his return, he made his first visit to Washington, to identify his collections under the supervision of Baird, and remained at the Smithsonian until April of the following year (1858). Baird, himself especially interested in reptiles, and finding a kindred interest in these neglected creatures in Kennicott, turned over to him extensive collections from the Mexican Boundary and Pacific Railway Surveys for description and report. This and the following winter of 1859, also spent in Washington, were scientifically the most fruitful periods in Kennicott's career. Already a field naturalist of note, he here made himself a scholar of the fine American school that has welded outdoor natural history with scholarly thoroughness. Kennicott's name is familiar to every herpetologist of the present day because it is attached to the species described during these periods. Some of them are notable forms in the extreme. He specialized on two important and complex groups of snakes, the gartersnakes and the rattlesnakes. His work as a describer of species proves to be extraordinarily sound, so that even in these groups in which the discrimination of species is difficult in the extreme, the forms described by him retain their validity under the scrutiny of later revisions. In the current check-list of amphibians and reptiles of North America, nineteen species are credited to Kennicott, and numerous Mexican forms are to be added to this list. Birds and mammals have been named for him. His own work on mammals, represented by the early paper on the Mammals of the Northwest and by a paper on the ground squirrels published in 1863, had become his chief interest after his northern expedition, and he had been encouraged by Agassiz to work on this group.

In 1859 he embarked on a plan which had suggested itself to him at Pembina two years before for the exploration of Arctic America under the auspices of the Smithsonian Institution and with the co-operation of the Hudson Bay Company. With all arrangements completed, he reached Fort William, on the north shore of Lake Superior on May 10th, to spend nearly three and a half years in the Mackenzie and Yukon basins collecting geological specimens, fishes, mammals, birds and their eggs, and insects of all kinds. Deep and lasting friendships, not only for himself, but for his profession of naturalist, grew naturally in the warmth of his zeal and his boundless enthusiasm; and these friendships may have had results even more far-reaching than his own work. The news of the war did not reach him until early in 1862, and he set forth at once for home, reaching Chicago in October. His friends and family dissuaded him from his first intention of joining the army, and he returned for a third winter to Washington.

On his return to Chicago in 1863, his renown had so grown, and the appreciation of the importance of his collections in the North had become so appreciated, that a group of public spirited citizens of Chicago undertook the reorganization of the Academy of Sciences, and raised funds to make possible the establishment of an adequate museum of natural history. To this new museum the Smithsonian Institution, prompted by the ever-generous Baird, at once offered a share of the Arctic collections, and a complete series of whatever other collections were available. Kennicott was made Curator, and subsequently was elected Director and Trustee.

In 1865 he was again off to the North as one of the leaders of the exploring party of the Western Union Telegraph Company, to survey a route for a telegraph line to Europe via Alaska, Bering Strait, and Siberia. Sailing from New York to San Francisco, and crossing Central America in Nicaragua, Kennicott had his first view of the tropics and of tropical vegetation and animal life. In his party was William Healy Dall, who was to become one of America's great leaders in conchology and palaeontology, and whose life of Baird is so fine a memorial and so fine a record of the stimulating company of young naturalists like himself and Kennicott, who were assembled by Baird's influence.

The party met with interminable difficulties and delays in Russian Alaska. Kennicott had had a serious heart attack in San Francisco, brought on apparently by his struggles with the inefficient and autocratic management of the affairs of the party by its leaders, in whom jealousy of Kennicott was obvious. The winter was passed, with constant disaffection among the party, and with daily discovery of new deficiencies in the equipment, and spring came to find the expedition seriously crippled, but planning to push on up the Yukon to connect the known lower course of the great river with the headwaters which were already known from Canadian explorations, and which Kennicott also knew from personal experience.

On May 12, 1866, Kennicott overexerted himself in saving one of the Russian members of the party from drowning in the ice-filled river. He seems to have felt some foreboding of his impending death, for he was unable to sleep, and wrote out instructions for the conduct of the party in case of any accident to himself. He arose early, and walked to the bank of the Yukon. When he did not return, his companions set out in search of him, and found his dead body lying undisturbed, his compass set on the ground, and the bearings of the surrounding mountain peaks drawn in the mud, showing that his last occupation had been with the map of the Nukto region. So died one of the foremost naturalists of his generation, at the age of thirty and a half years, at the threshold of a career of extraordinary promise.

The two figures of heroic stature in the history of American Museums are Louis Agassiz and Spencer Fullerton Baird. These men were Kennicott's ideals and models as they may well be for museum men in our own day. Had Kennicott lived, I feel certain that his name would be linked with theirs as the third great museum founder in North America.

Louis Agassiz combined in his wonderful personality charm and poise, unfailing democracy, a vast enthusiasm for the study of the surrounding world, and a faith equally strong that there was some sort of salvation in that study. For Agassiz, natural history was a way of life. "He arrived in America with no resource but the promise of a course of lectures; but his real resource was one of which he was always assured, having always counted on it and never found it to fail,—the good will of every fellow-creature in whose presence he could find an opportunity to describe his aims." I cannot find better words to describe the greatness of Louis Agassiz than to continue with those of William James, another of the few genuinely great men that our country has produced. He writes:

"His belief in these aims was so intense and unqualified that he could not conceive of others not feeling the furtherance of them to be a duty binding also upon them. Agassiz came before one with such enthusiasm glowing in his countenance,—such a persuasion radiating from his person that his projects were the sole things really fit to interest man as man,—that he was absolutely irresistible. He came, in Byron's words, with victory beaming from his breast, and every one went down before him, some yielding money, some time, some specimens, and some labor, but all contributing their applause and their godspeed. And so, living among us from month to month

and from year to year, with no relation to prudence except his pertinacious violation of all her usual laws, he on the whole achieved the compass of his desires, studied the geology and fauna of a continent, trained a generation of zoologists, founded one of the chief museums of the world, gave a new impulse to scientific education in America, and died the idol of the public, as well as of his circle of immediate pupils and friends.

"He elevated the popular notion of what a student of Nature could be. Since Benjamin Franklin, we had never had among us a person of more popularly impressive type. He did not wait for students to come to him; he made inquiry for promising youthful collectors, and when he heard of one, he wrote, inviting and urging him to come. Thus there is hardly one now of the American naturalists of my generation whom Agassiz did not train." . . . The naturalists of our later generation were all trained or stimulated by contact with these men, so that we are spiritual grandchildren and great-grandchildren of Louis Agassiz.

The truly great and still vital Museum of Comparative Zoology at Harvard is a tangible monument to Agassiz, but he left a self-perpetuating spiritual monument in the biological department of every University of the country. He became, in fact, our legendary figure in natural history, like Washington and Lincoln in our national life.

Spencer Fullerton Baird was scarcely less remarkable a person than Agassiz, and even less concerned with his own fortune, so be that he could further the cause of the broad field of natural history in America. Sixteen years younger, he formed an Anglo-Saxon supplement to the half Gallic enthusiasm of Agassiz, and many of the projects of the latter were furthered or carried out or helped to publication by Baird's steadfast effort. Like Agassiz, he sought out promising young naturalists and with a hundred dollars here and fifty there, set their feet more firmly on the way, and by encouragement and the inevitable contagion of his own unselfish interest, made scientists of them. It was such a grant that established Kennicott on his course, in the commission to write the report on the Quadrupeds of the Northwest. C. Hart Merriam writes of Baird:

"Baird was of the type that make the best naturalists. Beginning as a field collector and student of birds and soon expanding his interests to include reptiles, batrachians, fishes, fresh-water mollusks, fossil shells, fossil bones, mammals and plants, he acquired a deep understanding of the fauna and flora of his home region, which in turn created a thirst for broader knowledge, leading to collecting trips in many states, to exchanges with many lands, to the bringing about of natural history explorations in the far west and far north, till his collections overflowed with representatives of the major part of the vertebrate fauna of the continent. In his studies of this material he became the keenest, ablest and most authoritative of American writers on vertebrate zoology. No other person had ever combined in equal degree the qualities of the successful museum man with the high scientific attainments of the monographer of groups.

"Agassiz combined two quite distinct qualities—those of the patient investigator and the popular lecturer, and with his genial manner and pleasing address, did more than any other man, before or since, to popularize the study of natural history.

"Baird, on the other hand, while a wise councilor and a born organizer and leader, was personally so modest and shy that he never appeared on a public platform; a man of tireless energy, an enthusiastic collector, a critical student, and able delineator of the characters of animals, the best informed man in the world on the vertebrate faunas of North America, he became, as summarized by the Encyclopedia Britannica, 'the most representative general man of science in America.'"

Like Agassiz he left both tangible and spiritual monuments. The new National Museum, and the U. S. Fish Commission were created by him and are still largely infused with the Bairdian spirit; the great Marine Biological Laboratory at Woods

Hole grew out of Baird's Fisheries Station and Agassiz's summer school for biologists. Yet Baird's name is known only to a few, much the same few, perhaps, who have some memory of Kennicott. I am sure it is with Agassiz and Baird, the museum founders, that Kennicott should be remembered.

You have already heard of the importance of Kennicott in the early years of the Chicago Academy of Sciences. When the reorganization took place in 1863, he was the obvious and perfect choice for Director for the new museum, which was the main object of the Academy. I find a simple statement of his aim and plan in a letter to MacFarlane, a friend on the Mackenzie, to whom he writes: "You have heard me speak of my wish to establish a good museum of natural history in Chicago which should enable me to work more effectually at what I consider my vocation—the making popular of natural history, and its advancement. At present the only good museums in America are along the Atlantic States and in eastern Canada, therefore a good museum where naturalists can study at the West is a great desideratum." He writes again: "I shall be paid a regular salary, which, if not large, will still keep me respectably, and enable me hereafter to devote myself wholly to natural history and to the creation of a great museum." Kennicott was a worthy disciple of the patriarchal Baird, who, so far as natural history is concerned, was essentially the founder of the United States National Museum; and with the association of his friend of Smithsonian days, William Stimpson, in the project, the foundation was laid for the development of a truly great museum in Chicago.

The foundation and flourishing beginning of the museum of the Chicago Academy of Sciences held forth the promise that Chicago might take the lead in the museum sciences. It profits little to speculate on the altered course of history if crucial events had fallen out differently, but on this occasion I may express in Kennicott's memory the conclusion which seems to me inevitable—that his death in 1866 was so bitter and vital a blow to the Academy that when there came the second blow of the fire in 1871, which destroyed not only the collections but Stimpson's life work in his notes and manuscripts, Chicago was left leaderless in this field, and there was a generation lost to the development of natural history as it is expressed in the public museum. Museum natural history was moribund in consequence, until the foundation of the Field Museum in the nineties and the erection of the present Academy building rejuvenated these interests. Had Kennicott lived, I am sure that his wise and enthusiastic leadership would have placed Chicago in the lead in the museum field in America. The memory of Robert Kennicott may help those of us who are in the museum of the Academy of Sciences and in Field Museum or engaged with allied interests in schools and colleges and universities, to strive toward Kennicott's fine ideals in our own day, and we may be permitted enough local patriotism to hope that our museums may yet take that lead in America toward which he had started them.

It is the personal charm of Robert Kennicott's character, his ability to form deep and lifelong friendships with scholars like Baird and Stimpson and equally to meet and befriend the fur-traders and Indians of the far-off Arctic that has most impressed me. This fundamental quality that makes the true leader, the inspired teacher, and the founder of living institutions, makes Kennicott genuinely comparable with Agassiz, and a worthy disciple of Baird. This great and lovable personality was lost to us in Chicago by the death of Robert Kennicott. I know only too well, how the halls of this Academy in 1866 echoed to the bitter cry for a friend and companion forever lost of "Robert, Robert, Robert Kennicott."



KENNICOTT'S HOME

In this house Kennicott spent much of his early life and wrote many of his reports.
It was built in "The Grove" in 1845.

James O'Donnell Bennett has linked the past with the present in a brief note in the Voice of the People, of the Chicago Tribune, as follows:

EMERSON ON KENNICOTT

Chicago, Nov. 15.—On the night following last Wednesday's commemoration at the Academy of Sciences of the 100th anniversary of Robert Kennicott's birth I was reading in the 10th volume of Ralph Waldo Emerson's "Journals"—one of my favorite "bedside books"—and came on this entry under date of March 26, 1864:

"At the club, where was Agassiz just returned from his lecturing tour, having created a natural history society in Chicago, where four thousand five hundred dollars were subscribed as its foundation by 19 persons. And to which he recommended the appointment of Mr. Kennicott (sic) as the superintendent."

The great Agassiz's recognition of the remarkable gifts of our townsman, who died untimely, has, I believe, not been so specifically recorded elsewhere.

Later Mr. Emerson added a footnote, saying:

"When I visited the Chicago Natural History museum in 1865, the fund had become \$50,000."

Chicago's population in 1864-'65 was about 175,000. It is now 21 times as large. But, important and vivid though the work of the academy and its museum is to all Chicagoland—especially the children—could anybody, Mr. Editor, raise \$50,000 for the institution today?

It needs the money.

JAMES O'DONNELL BENNETT.



NOTES FROM
The Illinois Audubon Society

(Section of Popular Ornithology of the Chicago Academy of Sciences)

"COLLECTED BY ROBERT KENNICOTT"

By E. R. FORD

Nothing was saved. The exhibits and collections of the Chicago Academy of Sciences were completely destroyed in the "Great Fire" of October 1871. Among these treasures were the specimens representing the tireless labors of Robert Kennicott, first Director of the Academy.

From the date of this loss until April 1930, when, by generous gift, the collections of Northwestern University's Museum came into the Academy, not a specimen taken by Kennicott was contained within its walls. Then more than a hundred birds, about twenty mammals, and almost two hundred reptiles and amphibians which he had collected, were acquired.

As in the case of so many old collections, much of the original data is wanting. There is a catalog of the birds which is far from complete, especially as to dates. But in most instances the general locality is given and we have been able to check this information with the chronicle of Kennicott's activities contained in his memoir. This was prepared by a committee made up of men who were Kennicott's contemporaries; it was written not long after his death and in it was used much material from Kennicott's own hand. It is to be found in Volume I, Part II of the "Transactions of the Chicago Academy of Sciences," published in 1869.

The phrase "dull science" becomes inept indeed when one follows the movements of Robert Kennicott from the beginning of his active collecting years, in 1853, to his untimely, lonely death in 1866. Even the contact with specimens prepared by hands, now dead for seventy years, stirs the "closet" worker to venturous imaginings and rouses the ineffable sense of things "far away and long ago."

By the record of these movements, we may determine, with fair accuracy, the history of Kennicott's birds in the Academy collection. They fall into four main groups: those taken in Southern Illinois, in 1855 and 1857; those taken in the late summer and fall of 1857 in the country of the Red River, of the North (what an enchantingly descriptive name of a region unknown, this must have seemed to the youth of twenty-two!); those arduously come by, in the years 1859 to 1862, on the long trail to Fort Yukon, by way of Fort William, Norway House, Fort Resolution and Fort Simpson.

and on the long return; and, finally, the birds taken about home, "The Grove," at West Northfield, in seasons spent there in the years from 1853 to 1859.

The first excursion to Southern Illinois, we read, was made for the Natural History Survey of the state in 1855 and the second, in 1857, was sponsored by Northwestern University. His work in that region is represented in the Academy's collection by birds of the species named below.

Red-head	Purple Martin	Black-throated Green Warbler
Ruffed Grouse	Tufted Titmouse	Cerulean Warbler
Louisiana Paroquet	Blue-gray Gnatcatcher	Sycamore Warbler
Yellow-billed Cuckoo	Cedar Waxwing	Palm Warbler
Belted Kingfisher (2)	Yellow-throated Vireo (2)	Kentucky Warbler
Flicker	Red-eyed Vireo (2)	Mourning Warbler
Pileated Woodpecker (2)	Black and White Warbler (2)	Hooded Warbler
Red-headed Woodpecker	Prothonotary Warbler	Wilson's Warbler
Red-bellied Woodpecker (2)	Tennessee Warbler	Scarlet Tanager
Crested Flycatcher	Parula Warbler	Cardinal
Wood Pewee	Magnolia Warbler	Dickcissel
		Chipping Sparrow

"May 9, May 11, May 12." These are the dates given in the catalog for several of the warblers. They correspond, of course, to the season when the resident members of this group are seen like small sparks shooting here and there among the leaves, busy at love making and house building, and when the laggards in migration mingle with their congeners and add to the scene of color and of motion. On such days, the wind's warm fragrance in his nostrils, with the zest of a boy armed and equipped by "Science" to do the thing which of all things in the world he loves best to do, we see the young Kennicott afield. Looking again at the list one may doubt that the taking, in this region at about the same time, of the now extinct Paroquet, gave the collector half the thrill he had in securing a dozen or more of the scarcely less brilliantly marked warblers.

On May 6 he obtained a Chipping Sparrow. There is a note on the label attached which, one must admit, does not carry a very important scientific message. But who would not be the boy, the tyro-scientist, who similarly records his "observations" of a Robin, a Catbird, or a "Chippy"? The label: "Union Co., Ill., May 6. A pair are now building a nest on the top of an apple tree under my window. I saw one beaten by a sylvia."

Robert Kennicott's ardor in the year 1857 must have come near to satisfaction. Soon after his return from the austral counties of our state we find him setting forth for the Red River of the North. This was an expedition of which the spoils were to be divided between Northwestern University and the Smithsonian Institution. In late July, it is recorded, he arrived at St. Paul. His itinerary is not revealed, but we find him later at Pembina, in what is now North Dakota. That he passed through Crow Wing County, Minnesota, en route or upon returning, is made evident by a specimen of the Canada Jay taken there in October. The label bears an interesting inscription: "Wiscash Chan of Cree Indians. This has been changed to Whisky John by the traders."

Besides this jay the Academy collection contains, of the results of this expedition, two sharp-tailed grouse, a screech owl, a hawk owl, a pipit, a palm warbler, a savanna sparrow and two Lapland longspurs. To the last there is a reference on the margin of the catalog, evidently transcribed from the original label, which tells us "Several seen here (near Pembina) sitting in the road, usually solitary. R. Kennicott." It is likely that this species, although not now uncommon in the Chicago region, was new to Kennicott or that he had not frequently observed it.

An adventure which was to take him by trail and portage, through the forests of the North and to the Arctic tundras, up the Mackenzie and across the mountains to the headwaters of the Yukon, was now entered upon by the young naturalist with—we may only imagine—what zestful joy. Here was no voyage for the timid, no undertaking for the half-hearted. His journal, extracts from which may be found in the memoir, is a mine of information of the region traversed and a tale of cheerful and courageous endeavor, humorous withal and inspiring. He left Chicago, April 28, 1859, and arrived here on his return on October 17, 1862.

Of all the great collection he made during his long absence, said to have excited the interest of Abraham Lincoln at the Smithsonian (where also, it is said, Lincoln met Kennicott) but three specimens have come to the Academy. There is a horned grebe from Fort Resolution, secured June 3, 1860, a Hudson's spruce grouse, taken at Fort Simpson, October 13, 1859, and a Lapland longspur, without date, the locality of which is given "Barren Grounds, Arctic America."

We know that our naturalist (1853-1859) took the field on behalf of Northwestern University, the Smithsonian Institution, the Natural History Survey of Illinois, and the Academy. It is probable that the Natural History Survey specimens went to Washington. At any rate we read that the Smithsonian Institution provided the field equipment for this work and we have found no evidence that any of Kennicott's birds were deposited in any state building. Some of the collector's West Northfield specimens, as well as those from other localities, came to Northwestern at first hand, some came through the Academy, and some came by way of exchange or gift through the Smithsonian Institution, which through its generosity started so many collections, and disseminated Kennicott's specimens throughout the country's museums. In any event our collection contains, of his locally taken birds, the specimens here named:

Mallard (2)	White-breasted Nuthatch	Blackburnian Warbler
Turkey Vulture	Red-breasted Nuthatch	Chestnut-sided Warbler
Coopers Hawk	Brown Creeper	Northern Water-Thrush
Sora (2)	Catbird	Bobolink
Killdeer	Brown Thrasher	Orchard Oriole
Upland Plover	Robin	Baltimore Oriole
Golden Plover	Wood Thrush	Bronzed Grackle
Wilson's Phalarope	Hermit Thrush	Rose-breasted Grosbeak
Passenger Pigeon	Golden-crowned Kinglet	Red Crossbill (3)
Ruby-throated Hummingbird	Ruby-crowned Kinglet	Towhee
Hairy Woodpecker	Northern Shrike	Tree Sparrow
Least Flycatcher (2)	Blue-headed Vireo	White-crowned Sparrow
Tree Swallow	Warbling Vireo	White-throated Sparrow
Blue Jay	Yellow Warbler	Fox Sparrow
	Black-throated Blue Warbler (4)	Swamp Sparrow

Among these, also, as among the Southern Illinois birds, we find an extinct species represented. A score of years was to elapse before the passenger pigeon should become scarce. Nelson, in the seventies, found Wilson's phalarope a common breeding bird of Cook County. Hence the taking of one on May 25, 1855, at West Northfield was to be expected. One would seek long and vainly in Northfield Township today for one of these birds. Whether the turkey vulture was common here at that time or not there is no evidence. Probably it was not more common, being chiefly a southern form, than now, when one or two occasionally are observed in the air. Few, however, are collected.

If these notes of Kennicott's birds have no other value they may serve to show posterity that in the year that marked the centenary of the naturalist's birth he was yet remembered, and that, to show honor to its first zoologist, Chicago, through its Academy of Sciences, took account of the vestiges remaining of his work.

Program of Activities
of
The Chicago Academy of Sciences

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MAMMALS
OF THE
CHICAGO REGION

BY
TAPPAN GREGORY

CHICAGO, ILLINOIS
PRICE FIFTY CENTS

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The Illinois Audubon Society joins the Academy in making this publication possible.

MAMMALS OF THE CHICAGO REGION

by TAPPAN GREGORY

FOREWORD

In preparing this paper I have made every effort not to miss records of any species or race of mammals taken in the Chicago Area. Of course, there is no certainty that some have not escaped me. I am grateful for the gracious cooperation given to me as to extant specimens by the following institutions: Chicago Academy of Sciences, Field Museum of Natural History, Museum of Comparative Zoology, United States National Museum, United States Bureau of Biological Survey, American Museum of Natural History, Milwaukee Public Museum, and the Illinois State Natural History Survey, and by the following individuals: J. J. Mooney, Dr. M. W. Lyon, Jr., Dr. Alexander Wetmore, Dr. H. H. T. Jackson, and A. M. Bailey.

To Roy V. Komarek of the Chicago Academy of Sciences I am indebted for compiling some of the measurements given in this paper, based on specimens from the region. Others have been compiled from published data of recognized authorities, particularly the late Charles B. Cory. Walter L. Necker collaborated with Roy V. Komarek in writing the preliminary discussion in the text entitled "The Classification of Mammals" and in tabulating and checking the records in the Chicago Academy of Sciences and Field Museum, and E. G. Wright has made the drawings which illustrate the article.

I have consulted as many of the original references given in synonymies as were available. In addition to those personally examined, some others are listed on the authority of well known authors, especially Gerrit S. Miller, Jr. Type localities and ranges have been variously taken from published works of Gerrit S. Miller, Jr., Glover M. Allen, A. H. Howell, E. V. Komarek and D. A. Spencer, H. E. Anthony, A. B. Howell, H. H. T. Jackson, Charles B. Cory, E. W. Nelson and E. A. Goldman. All of these works are listed in the bibliography. For the description of the region I referred to F. M. Fryxell.

The Common House Mouse and House or Norway Rat are not included in the list that follows.

All measurements are given in millimeters. The collections where specimens are lodged are indicated as follows: A, Chicago Academy of Sciences; F, Field Museum of Natural History; G, Benjamin T. Gault Collection now held by the author; NM, U. S. National Museum; M, J. J. Mooney Collection at Deerfield; MCZ, Museum of Comparative Zoology at Harvard; NY, American Museum of Natural History; and BS, U. S. Bureau of Biological Survey.

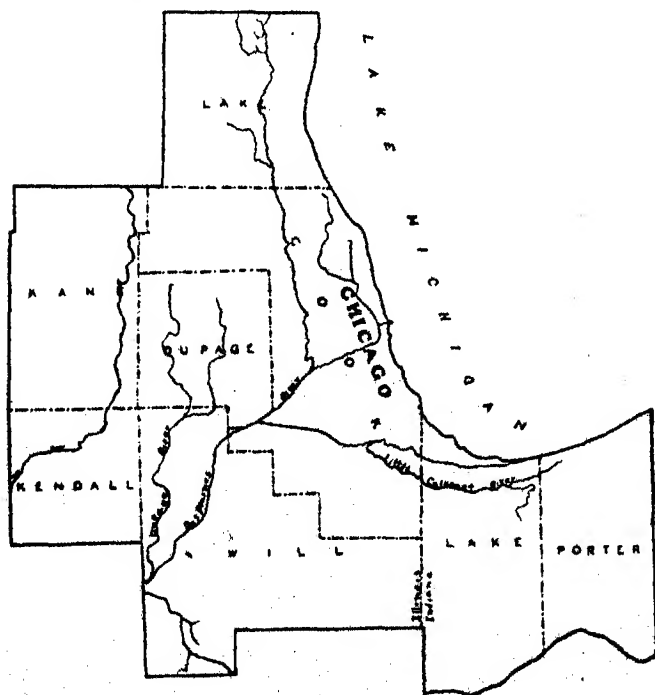
In selecting records of specimens I have tried to cover all localities where specimens have been taken in the area. No effort has been made to publish all records of existing specimens except for those in the Chicago Academy of Sciences and the Field Museum of Natural History.

In connection with many of the mammals listed I did not have much first hand information. In such cases I have taken the liberty of drawing upon the published observations and conclusions of others with the result that this list is in no small measure a compilation. I have tried to assure myself, either from my own observation or from careful examination of available published material that statements of fact and conclusions are accurate and generally accepted as correct.

Dr. W. H. Osgood and Colin C. Sanborn of the Field Museum were of great help to me on every phase of the preparation of this paper. Chicago, Illinois, February 4, 1936.

DESCRIPTION OF THE REGION

For the purposes of the ensuing notes, the Chicago Area is considered to comprise the counties of Lake, Cook, DuPage, Kane, Kendall, and Will in Illinois, and Lake and Porter in Indiana. County lines are taken as boundary



lines rather than the hypothetical circumference of a circle with a given radius, for convenience in the determination of location of records. In a general way the extent of the area included within the outside boundaries of the counties

named will approximate the territory inside the limits of a circle of fifty mile radius, centering on Madison and State Streets, Chicago.

This area is made up of a series of plains, ridges and valleys, formed by erosion of pre-glacial bedrock, supplemented by the action of successive glaciers in depositing debris, thus creating at their limits what are known as terminal moraines and throughout their extent the more widely and evenly distributed ground moraines, as they alternately advanced and receded. When the ice of the glaciers finally permanently disappeared, there remained over a portion of the Chicago Area a body of water named Lake Chicago by the geologists. It drained into the Gulf of Mexico through various rivers. Owing to the presence of the Continental Divide between the Mississippi and St. Lawrence systems, which cuts through the Chicago Area, the area now drains into both of these systems. The principal basis for the soils that cover the bedrock underlying the region is what is known as glacial drift, consisting largely of clay with stones embedded.

The area is one of the most fertile agricultural sections of the continent, one having a great variety of rich soils and luxuriant vegetation. The climate is temperate, with little severe cold or excessive heat,—due to the moderating influence of Lake Michigan. Sudden, marked changes of temperature are characteristic at all seasons. Lake Michigan is 580 feet above sea level but the elevations of the area vary from a low somewhere between 400 and 500 feet above the sea to the high point in Kane County of 1,000 to 1,100 feet. The region as a whole is quite low and flat. Nevertheless, the ridges and plains, some covered with groves of oak, hickory, maple and other deciduous trees, some open and cultivated, the group of small lakes in the northern part of Lake County, Illinois, an occasional tamarack bog, the deep, brushy ravines extending inland from Lake Michigan, and the extraordinary sand dunes on the shore of the lake in Indiana, combine to offer an attractive variety of habitat for the local fauna. Much interesting swamp land still remains in the river bottoms.

It has long since been well recognized by naturalists that as an aid to the study of the distribution of animal life, it is necessary to divide this continent into life zones, governed largely, if not entirely, by variation in temperature. The Arctic, Hudsonian and Canadian Zones extend down from the far north, separated from the Chicago Area by the Transition Zone. The region falls within the Upper Austral Zone and to the south lie the Lower Austral and finally the Tropical Zones.

THE CLASSIFICATION OF MAMMALS

The classification of mammals, as we know it today, is based upon the internal and external anatomical resemblances existing between certain groups or individuals of a particular group. For pedagogical purposes this system is frequently compared to a tree with two main forks. All living matter is divided into two great divisions or Kingdoms, the Animal Kingdom and the Plant Kingdom represented on the tree as the two main forks. The fork indicating the Animal Kingdom, with which we are only concerned here, is divided into a number of lateral branches each of which may be referred to a group of animals having certain general characteristics in common. These groups are called Phyla and all animals possessing a vertebral cord are classed as belonging to the PHYLUM CHORDATA. The Phylum again is split up into somewhat smaller groups according to general similarities or dissimilarities, called classes. PISCES (Fishes, sometimes divided into several classes), AMPHIBIA (frogs, toads, salamanders), REPTILIA (turtles, crocodiles, snakes and lizards), AVES (birds), and MAMMALIA (mammals) constitute the Classes of Vertebrates. Mammals are distinguished from other warm-blooded vertebrate animals because they suckle their young and are covered with hair. In the same way the Class is subdivided into Orders, Orders into Families, Families into Genera, Genera into Species, and finally on the basis of finer distinctions Species are separated into Subspecies.

Latin names are used in classification by common consent of scientists the world over. In addition to avoiding the difficulties of common names which change with the locality but refer to the same animal, scientific names often refer to some peculiarity of structure, appearance, geographic distribution, or habit of the species. The name of the author who described the species follows the scientific name. The specimen upon which the original description is based is known as the TYPE and the locality from which it came the TYPE LOCALITY.

The teeth of Mammals are of great importance in their classification and are differentiated into incisors (conspicuous as the large gnawing teeth of the rodents), canines (fangs of the carnivores), premolars and molars (grinding teeth). To designate the arrangement and presence or absence of certain teeth a simple universally accepted formula has been devised. For example, the dental formula of Man is given as follows:

$$I. \frac{2-2}{2-2} \quad C. \frac{1-1}{1-1} \quad Pm. \frac{2-2}{2-2} \quad M. \frac{3-3}{3-3} = 32$$

The letters refer to incisors, canines, premolars and molars respectively, thus the formula as written indicates that the skull of Man possesses on each side in the upper jaw 2 incisors, 1 canine, 2 premolars, and 3 molars; in the lower jaw, 2 incisors, 1 canine, 2 premolars, and 3 molars, a total of 32 teeth in the skull.

List of Orders and Families of Mammals

- Class—Mammalia (Mammals)
 - Order—Marsupialia (Pouched Mammals)
 - Family—Didelphiidae (Opossum-like Marsupials)
 - Genus—Didelphis (Opossums)
 - Order—Insectivora (Insect-eating Mammals)
 - Family—Talpidae (Moles)
 - Genus—Scalopus
 - Genus—Condylura (Star-nosed Moles)
 - Family—Soricidae (Shrews)
 - Genus—Sorex
 - Genus—Cryptotis (Small Short-tailed Shrews)
 - Genus—Blarina (Short-tailed Shrews)
 - Order—Chiroptera (Bats)
 - Family—Vespertilionidae
 - Genus—Myotis
 - Genus—Lasionycteris
 - Genus—Pipistrellus
 - Genus—Eptesicus
 - Genus—Lasiurus
 - Genus—Nycticeius
 - Order—Carnivora (Flesh-eating Mammals)
 - Family—Ursidae (Bears)
 - Genus—Euarctos (Black Bears)
 - Family—Procyonidae
 - Genus—Procyon (Raccoons)
 - Family—Mustelidae
 - Genus—Martes (Martens)
 - Genus—Mustela (Minks and Weasels)
 - Genus—Lutra (Otters)
 - Genus—Mephitis (Skunks)
 - Genus—Taxidea (Badgers)
 - Family—Canidae
 - Genus—Vulpes (Foxes)
 - Genus—Urocyon (Gray Foxes)
 - Genus—Canis (Wolves and Coyotes)
 - Family—Felidae (Cats)
 - Genus—Felis (Cougars and Jaguars)
 - Genus—Lynx (Lynxes and Bobcats)
 - Order—Rodentia (Gnawing Mammals)
 - Family—Sciuridae
 - Genus—Marmota (Woodchucks)
 - Genus—Citellus (Ground Squirrels)
 - Genus—Tamias (Eastern Chipmunks)
 - Genus—Sciurus (Squirrels)
 - Genus—Glaucomys (Flying Squirrels)
 - Family—Geomyidae (Pocket Gophers)
 - Genus—Geomys

- Family—Castoridae (Beavers)
 - Genus—Castor
- Family—Cricetidae
 - Genus—Peromyscus (White-footed Mice)
 - Genus—Synaptomys (Bog Lemmings)
 - Genus—Microtus (Meadow Mice)
 - Genus—Pitymys (Pine Mice)
 - Genus—Ondatra (Muskrats)
- Family—Zapodidae
 - Genus—Zapus (Jumping Mice)
- Family—Erethizontidae (Porcupines)
 - Genus—Erethizon
- Order—Lagomorpha (Hares and Rabbits)
 - Family—Leporidae
 - Genus—Lepus (Hares)
 - Genus—Sylvilagus (Cottontails)
- Order—Artiodactyla (Hoofed Mammals)
 - Family—Cervidae (Deer)
 - Genus—Cervus (Wapiti)
 - Genus—Odocoileus (Black-tailed and White-tailed Deer)
 - Family—Bovidae
 - Genus—Bison (Bison)

MAMMALS OF WHICH ACTUAL SPECIMENS TAKEN IN THE CHICAGO AREA
ARE NOW IN EXISTENCE.

- Didelphis virginiana virginiana*—Virginia Opossum
- Scalopus aquaticus macrinus*—Prairie Mole
- Sorex cinereus cinereus*—Cinereous Shrew
- Cryptotis parva*—Small Short-tailed Shrew
- Blarina brevicauda talpoides*—Short-tailed Shrew
- Myotis lucifugus lucifugus*—Little Brown Bat
- Myotis keenii septentrionalis*—Trouessart's Bat
- Lasionycteris noctivagans*—Silver-haired Bat
- Eptesicus fuscus fuscus*—Big Brown Bat
- Lasiurus borealis borealis*—Red Bat
- Lasiurus cinereus*—Hoary Bat
- Nycticeius humeralis*—Rafinesque's Bat
- Procyon lotor hirtus*—Upper Mississippi Valley Raccoon
- Mustela vison allegheniensis*—Least Weasel
- Mustela noveboracensis noveboracensis*—New York Weasel
- Mustela vison mink*—Common Mink
- Mustela vison letifera*—Mississippi Valley Mink
- Mephitis mephitis minnesotae*—Minnesota Skunk
- Mephitis mesomelas avia*—Illinois Skunk
- Taxidea taxus taxus*—American Badger
- Vulpes fulva*—Eastern Red Fox
- Urocyon cinereoargenteus cinereoargenteus*—Eastern Gray Fox
- Canis latrans*—Northern Coyote
- Marmota monax monax*—Southern Woodchuck
- Citellus franklini*—Franklin Ground Squirrel
- Citellus tridecemlineatus tridecemlineatus*—Thirteen-striped Ground Squirrel
- Tamias striatus griseus*—Gray Chipmunk

Sciurus hudsonicus loguax—Southern Red Squirrel
Sciurus carolinensis leucotis—Northern Gray Squirrel
Sciurus niger rufiventer—Western Fox Squirrel
Glaucomys volans volans—Small Eastern Flying Squirrel
Geomys bursarius illinoensis—Illinois Pocket Gopher
Castor canadensis canadensis—Canadian Beaver
Peromyscus maniculatus bairdii—Baird White-footed Mouse
Peromyscus leucopus noveboracensis—Northern White-footed Mouse
Synaptomys cooperi stonci—Stone Lemming Mouse
Microtus pennsylvanicus pennsylvanicus—Eastern Meadow Mouse
Microtus ochrogaster—Prairie Meadow Mouse
Pitymys pinetorum scalopsoides—Mole Pine Mouse
Ondatra zibethica zibethica—Common Muskrat
Zapus hudsonius hudsonius—Hudson Bay Jumping Mouse
Erethizon dorsatum dorsatum—Canada Porcupine
Sylvilagus floridanus mearnsii—Mearns Cottontail

**MAMMALS OF BROAD RANGE WHICH MIGHT OCCUR IN THIS AREA
BUT WHICH HAVE NOT YET BEEN RECORDED.**

Condylura cristata—Star-nosed Mole.
Sorex longirostris longirostris—Bachman Shrew.
Pipistrellus subflavus subflavus—Georgian Bat.

**MAMMALS RECORDED FROM THE CHICAGO AREA, NOW EXTINCT IN THAT
AREA, AND OF WHICH NO SPECIMENS HAVE BEEN PRESERVED.**

Euarctos americanus americanus—Black Bear.
Martes americana americana—Marten.
Canis nubius—Timber Wolf.
Lynx rufus rufus—Bobcat.
Cervus canadensis canadensis—American Wapiti.

**MAMMALS WHICH UNDOUBTEDLY HAVE OCCURRED IN THE CHICAGO RE-
GION IN THE PAST BUT OF WHICH THERE ARE NO ACTUAL RECORDS
BASED ON SPECIMENS.**

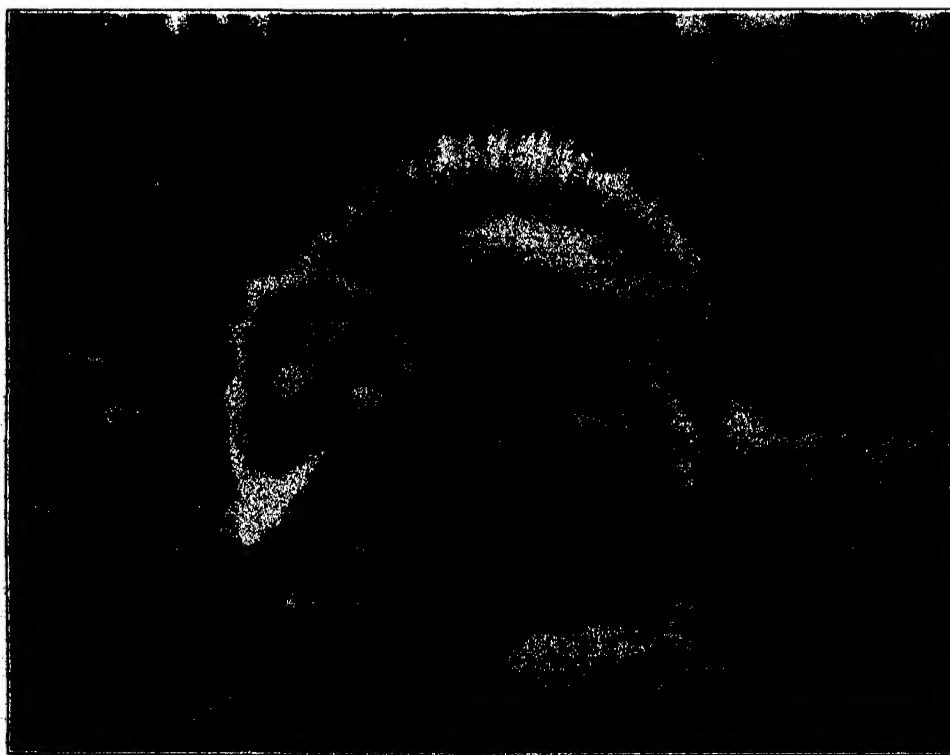
Martes pennanti pennanti—Fisher.
Lutra canadensis canadensis—Canada Otter.
Canis lycaon—Eastern Timber Wolf.
Felis concolor cougar—Adirondack Cougar.
Lynx canadensis canadensis—Canada Lynx.
Lepus americanus phaeonotus—Minnesota Varying Hare.
Odocoileus virginianus—White-tailed Deer.
Bison bison bison—Plains Bison.

Key to the Orders, Families, Genera and Species

- I. Fingers elongated and attached to body by membrane to form wings. ORDER *Chiroptera*, Family *Vespertilionidae* (Bats).
 1. Upper surface of membrane connecting tail and legs wholly or partially bare.
 - A. Upper surface of membrane connecting tail and legs wholly bare.
 - a. Total number of teeth thirty-eight. Total length not over 3.52 inches (89.5 mm). Genus *Myotis*.
 - a¹ Ear laid forward not extending beyond end of nose. Species *lucifugus*. p. 30.
 - b¹ Ear laid forward extending beyond end of nose. Species *keeni*. p. 31.
 - b. Total number of teeth thirty. Total length over 3.52 inches (89.5 mm) but not over 3.69 inches (93.5 mm). Genus *Nycticeius*, Species *humeralis*. p. 33.
 - c. Total number of teeth thirty-two. Total length over 3.69 inches (93.5 mm) Genus *Eptesicus*, Species *fuscus*. p. 32.
 - B. Upper surface of membrane connecting tail and legs furred one-third to one-half its length. Genus *Lasionycteris*, Species *noctivagans*. p. 31.
 2. Upper surface of membrane connecting tail and legs completely furred. Genus *Lasiurus*.
 - A. Total length not over 4.33 inches (110 mm). Species *borealis*. p. 32.
 - B. Total length over 4.33 inches (110 mm). Species *cinereus*. p. 33.
- II. Fingers not elongated and not attached to body by membrane to form wings.
 1. Front teeth (incisors) chisel-like and separated from other teeth by decided space.
 - A. One pair of incisor teeth in upper jaw. Ears medium or small, less than one inch (25.4 mm) in length. ORDER *Rodentia* (Gnawing mammals, as porcupines, beavers, squirrels, mice, muskrats, etc.)
 - a. Pelage mixed with stiff quills on upper parts. Family *Erethizontidae*, Genus *Erethizon*, Species *dorsatum*. p. 67.
 - b. Pelage without stiff quills.
 - a¹ Tail scaly, flat, at least four inches (101.6 mm) wide. Family *Castoridae*, Genus *Castor*, Species *canadensis*. p. 57.
 - b¹ Tail not greatly flattened.
 - a² Tail laterally compressed. Hind feet partially webbed. Family *Cricetidae*, Genus *Ondatra*, Species *sibirica*. p. 64.
 - b² Tail not laterally compressed, but rounded or slightly flattened.
 - a³ Membranous expansion of skin between fore and hind feet. Family *Sciuridae*, Genus *Glaucomys*, Species *volans*. p. 55.
 - b³ No membranous expansion of skin between fore and hind feet.
 - a⁴ Pouches in cheeks with openings outside the mouth. Family *Geomyidae*, Genus *Geomys*, Species *bursarius*. p. 56.
 - b⁴ Cheek pouches absent or with openings inside the mouth.
 - a⁵ Length of head and body more than ten inches (254 mm).
 - a⁶ Tail less than eight inches (203.2 mm) long. Family *Sciuridae*, Genus *Marmota*, Species *monax*. p. 47.
 - b⁶ Tail more than eight inches (203.2 mm) long.
 - a⁷ Tail very bushy with hairs more than an inch (25.4 mm) long.
 - a⁸ Color gray above, mainly white below. Family *Sciuridae*, Genus *Sciurus*, Species *carolinensis*. p. 53.
 - b⁸ Color grizzled buffy above, clear buffy below. Family *Sciuridae*, Genus *Sciurus*, Species *niger*. p. 54.
 - b⁷ Tail moderately bushy with hairs less than an inch (25.4 mm) long. Family *Sciuridae*, Genus *Citellus*, Species *franklinii*. p. 49.
 - a⁵ Length of head and body less than ten inches (254 mm).
 - a⁶ Head and body more than six inches (152.4 mm) long.
 - a⁷ Back with numerous (thirteen) stripes. Family *Sciuridae*, Genus *Citellus*, Species *tridecemlineatus*. p. 49.
 - b⁷ Back with few or no stripes.

- a⁸ Back with three dark and two light stripes. Family Scuridae. Genus *Tamias*, Species *striatus*. p. 50.
- b⁸ Back without stripes, sides sometimes with a single stripe. Family Scuridae. Genus *Sciurus*, Species *hudsonicus*. p. 52.
- b⁹ Head and body less than six inches (152.4 mm.) long.
 - a⁹ Tail much longer than head and body. Family Zapodidae. Genus *Zapus*, Species *hudsonius*. p. 66.
 - b⁹ Tail about equal to or shorter than head and body.
 - a⁹ Ears large and leafy, underparts white.
 - a⁹ Size larger, hind foot .75 - .87 inches (19 - 22 mm.), tail usually not sharply bicolor. Habitat chiefly woodland. Family Cricetidae, Genus *Peromyscus*, Species *leucopus*. p. 60.
 - b⁹ Size smaller, hind foot .71 - .79 inches (18-20 mm.), tail usually sharply bicolor. Habitat chiefly grassland. Family Cricetidae, Genus *Peromyscus*, Species *maniculatus*. p. 59.
 - b⁹ Ears small and rounded, underparts not white.
 - a⁹ Tail very short, less than one inch (25.4 mm) in length.
 - a¹⁰ Upper front teeth slightly grooved, color grayish. Family Cricetidae, Genus *Synaptomys*, Species *cooperi* p. 61.
 - b¹⁰ Upper front teeth not grooved, color reddish brown. Family Cricetidae, Genus *Pitymys*, Species *pinetorum*. p. 63.
 - b⁹ Tail more than one inch (25.4 mm) long.
 - a¹⁰ Color grayish or blackish without speckling. Family Cricetidae, Genus *Microtus*, Species *pennsylvanicus*. p. 62.
 - b¹⁰ Color brownish or blackish with a fine speckling throughout. Family Cricetidae, Genus *Microtus*, Species *ochrogaster*. p. 63.
- B. Two pairs of incisor teeth in upper jaw, the posterior ones partially concealed. Ears large, more than one inch (25.4 mm) in length. ORDER Lagomorpha, Family Leporidae, Genus *Sylvilagus*, Species *floridanus*. (Cottontails). p. 68.
- 2. Front teeth (incisors) not chisel-like and not separated from other teeth by decided space.
 - A. Five pairs of upper front teeth of nearly equal size between tusk-like canine teeth; female with abdominal pouch. ORDER Marsupialia, Family Didelphidae, Genus *Didelphis*, Species *virginiana* (Opossum). p. 25.
 - B. Less than five pairs of upper front teeth of nearly equal size between tusk-like canine teeth; female without abdominal pouch.
 - a. Middle pair of front teeth larger than succeeding pairs; length of head and body usually less than six inches (152.4 mm). Eyes and ears very small. ORDER Insectivora (Moles and shrews).
 - a¹ Forefeet greatly developed in width, much larger than hind feet; ends of teeth not red. Family Talpidae, Genus *Scalopus*, Species *aquaticus*. p. 26.
 - b¹ Forefeet not noticeably larger than hind feet; ends of teeth red. Family Soricidae.
 - a² Ears visible; tail more than one quarter total length. Genus *Sorex*, Species *cinereus*. p. 27.
 - b² Ears hidden by fur; tail less than one quarter total length.
 - a³ Total length more than three and one-half inches (88.9 mm). Genus *Blarina*, Species *brevicauda*. p. 28.
 - b³ Total length less than three and one-half inches (88.9 mm). Genus *Cryptotis*, Species *parva*. p. 28.
 - b. Middle pair of front teeth about equal in size to succeeding pairs. Length of head and body usually more than six inches (152.4 mm). Eyes and ears variable. ORDER Carnivora. (Raccoons, weasels, minks, skunks, badgers, foxes and coyotes).
 - a⁴ Tail distinctly marked with a series of dark rings. Family Procyonidae, Genus *Procyon*, Species *lotor*. p. 34.
 - b⁴ Tail without distinct dark rings.

- a² Color black with white stripes along the back. Family Mustelidae, Genus *Mephitis*, Species *mephitis*. p. 41.
- b² Color variable, no white stripes along back.
 - a³ Claws of forefeet long and heavy, over one inch (25.4 mm) in length, distinctly larger and longer than claws of hind feet. Family Mustelidae, Genus *Taxidea*, Species *taxus*. p. 43.
 - b³ Claws of forefeet less than one inch (25.4 mm) in length, not noticeably larger or longer than claws of hind feet.
 - a⁴ With five toes on hind foot.
 - a⁵ Total length less than seventeen inches (426.8 mm).
 - a⁶ Total length over nine inches (218.6 mm). Family Mustelidae, Genus *Mustela*, Species *noveboracensis*. p. 36.
 - b⁶ Total length less than nine inches (218.6 mm). Family Mustelidae, Genus *Mustela*, Species *rixosa*. p. 35.
 - b⁶ Total length over seventeen inches (426.8 mm). Family Mustelidae, Genus *Mustela*, Species *vison*. p. 38.
 - b⁴ With four toes on hind foot. Family Canidae.
 - a⁵ Total length over forty-three inches (992.2 mm). Genus *Canis*, Species *latrans*. p. 46.
 - b⁵ Total length less than forty-three inches (992.2 mm).
 - a⁶ Temporal crests widely separated. General color of upperparts grayish. Genus *Urocyon*, Species *cinereoargenteus*. p. 45.
 - b⁶ Temporal crests not widely separated. General color of upperparts reddish or yellowish brown. Genus *Vulpes*, Species *fulva*. p. 44.



VIRGINIA OPOSSUM

Mammals of Which Actual Specimens Taken in the Chicago Region
Are Now in Existence

VIRGINIA OPOSSUM

Didelphis virginiana virginiana Kerr.

Didelphis virginiana Kerr, 1792 Anim. Kingd. p. 193.

Didelphis virginiana virginiana Miller, 1924, List of North American Recent Mammals, 1923, U. S. Nat. Mus. Bull. 128, p. 3.

Range: From the Great Lakes southward to Oklahoma, northern Texas, and nearly to the Gulf Coast; east to the lower Hudson Valley and Long Island. **Type Locality:** Virginia.

General description: The Virginia Opossum is the only true marsupial which occurs in the Chicago Area. It has a long, pointed nose, long coarse outer hairs and soft under fur, and is grizzled in general appearance, with prominent, naked ears and long, practically naked, prehensile tail. The color of the face is white, washed with yellow.

Measurements: Length 680-850, Tail 280-345, Hind foot 67-76.

Dentition of Genus: I. $\frac{5-5}{4-4}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{3-3}$ M. $\frac{4-4}{4-4} = 50$

Habitat: It is essentially a woods animal, making its home in hollow trees, logs, stumps or any convenient hole, staying close to swamps or water courses.

Habits: Slow-moving and sluggish. Almost entirely nocturnal. Its habit of becoming limp, as though dead, whether a conscious trick or an involuntary reaction to fright, has given rise to the expression "playing 'possum." It does not hibernate.

Food: The Opossum is as nearly omnivorous as conceivable. Fruit, carrion, insects, and birds' eggs constitute the greater part of its diet.

Young: Probably one, possibly two litters in a season, with five to fourteen in each litter.

Local Distribution: It appears from the literature that the opossum at one time was not uncommon throughout the Chicago Area. It then became scarce in at least a large portion of the area until recent years, when it has been on the increase. It was not until 1910 that any actual specimens were taken which are still extant. These were collected by B. T. Gault in the Glen Ellyn woods in DuPage County and are now in my collection. Since then quite a substantial number has been collected and preserved between 1928 and the present time, so that it would seem that the opossum has again become not uncommon in this area.

Records:

ILLINOIS. COOK: Hazelcrest, F; DU PAGE: Naperville, F; Glen Ellyn, 2 G; KANE: St. Charles, 2 A; LAKE: Deerfield, M; Waukegan, 2 A.

INDIANA. PORTER: Dunc State Park, F; Mineral Springs, A.

PRAIRIE MOLE

Scalopus aquaticus machrinus (Rafinesque)

Talpa machrina Rafinesque, 1832, Atlantic Journal, Vol. 1, p. 61.

Scalopus aquaticus machrinus Miller, 1924, North Amer. Recent Mammals, 1923, U. S. Nat. Mus. Bull., 128, p. 14.

Range: Eastern Iowa and east of the Mississippi River, west of the Appalachian Mountains from western Wisconsin, northern Illinois, southern Michigan, south-western Ontario (Point Pelee) and northern Ohio, south to central Tennessee. **Type Locality:** Near Lexington, Fayette County, Kentucky.

General description: This subspecies represents the largest form in this genus of moles. It is characterized by its soft fur and by the tremendously developed forefeet and claws, used so extensively for digging. It has a short, nearly naked tail, and its general coloring is a dark, grayish brown. Its eyes and ears are so small that they can be seen only with difficulty, giving rise to the general impression that the mole is blind.

Measurements: Length 167-208, Tail 25-38, Hind foot 21-26.

Dentition of Genus: I. $\frac{3-3}{2-2}$ C. $\frac{1-1}{0-0}$ Pm. $\frac{3-3}{3-3}$ M. $\frac{3-3}{3-3} = 36$

Habitat: Subterranean tunnels.

Habits: Moles spend practically all their lives underground. They tunnel extensively not far below the surface, raising ridges of earth as they go. These tunnels are generally made in search of food, but some of them, of course, lead to the nest of grass and leaves, which lies a foot or so below the surface of the ground. It is thought that moles do not hibernate, but in winter they undoubtedly stay deep enough in the ground to avoid subjecting themselves to severe cold.

Food: Their food consists of worms and insects in general. They do not eat vegetable matter. They also eat meat when they can get it.

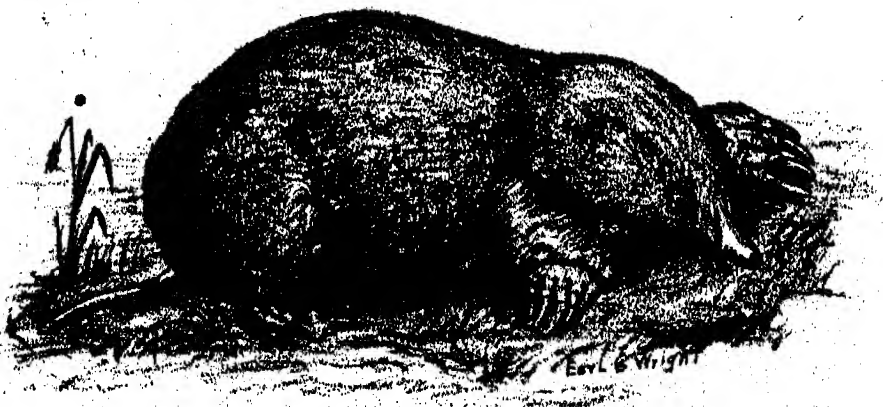
Young: Probably one litter of two to five each spring.

Local Distribution: The Prairie Mole is quite common throughout the Chicago Area.

Records.

ILLINOIS. COOK: Brookdale, F; Chicago, 10 F; Evanston, 2 A; Harvey, F; KANE: Geneva, 2 A; WILL: Joliet, F.

INDIANA: PORTER: Chesterton, A.



CINEREOUS SHREW

Sorex cinereus cinereus Kerr

Sorex arcticus cinereus Kerr, 1792 Anim. Kingdom, p. 206.
Sorex cinereus cinereus Jackson, 1925 Journ. Mamm., Vol. 6, p. 56.

Range: Northern Quebec and all of northern Canada, west to central Alaska, northern Kenai Peninsula, western British Columbia (except coastal region); south to New Jersey, the mountains of North Carolina and Tennessee, central Ohio, southern Indiana, northern Illinois, northeastern Iowa, eastern Minnesota, northern and eastern Manitoba, northern Saskatchewan, through the mountains of Idaho, western Montana and western Wyoming to northern New Mexico and northeastern and central Washington. **Type Locality:** Fort Severn, Ontario, Canada.

General description: Shrews are the smallest mammals we have, with slender bodies, long sharp noses, tails covered with hair, delicate feet and soft brownish fur. Their eyes are tiny and their ears barely show above the fur. Shrews of this genus are readily distinguishable from those of the genus *Blarina* by their relatively longer tails.

Measurements: Males, length 81-98, Tail 31-44, Hind foot 10-12; Females Length 82-103, Tail 32-43, Hind foot 11-12.7.

Dentition of Genus: I. $\frac{3-3}{1-1}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{1-1}$ M. $\frac{3-3}{3-3} = 32$

Habitat: They usually make their homes under logs, stumps or in among roots of trees, generally in damp woods, on stream banks or in swamps.

Habits: They are diurnal as well as nocturnal, but seldom show themselves, apparently preferring to travel under the leaves and grasses. They do not hibernate.

Food: Worms, insects and fresh meat, when obtainable, including on occasion, members of their own kind.

Young: Apparently at least two litters of from six to ten each during the summer and fall.

Local Distribution: While this little shrew is common throughout the area, most of the specimens which are still preserved were taken in Lake County since 1929. The earliest record extant is that of a specimen taken by Robert Kennicott in West Northfield, Cook County, catalogued in 1855 in the collection of the United States National Museum, where it now reposes as number 636/1787.

Records.

ILLINOIS. COOK: Calumet City, 2 A; Calumet Lake, A; Glencoe, A; Niles Center, 2 A; River Forest, A; KANE: Bowes, A; LAKE: Beach A; Camp Logan, 9 F; Deerfield, 8 A; Fox Lake, 3 F; Grayslake, A; Highland Park 2 A, 2 M; Lake Forest, F; Pistakee Bay, 2 F; Zion City, A; Prairie View, A.
INDIANA. PORTER, 2 N.M.



Short-tailed Shrew

SMALL SHORT-TAILED SHREW

Cryptotis parva (Say)

Sorex parvus Say, 1823 Long's Exped. Rocky Mts., vol. 1, p. 163.
Cryptotis parva Miller, 1912 North Amer. Land Mamm. 1911, p. 24.

Range: Austral region of the eastern United States (including both the Austroriparian and Carolinian Faunas) from Texas and eastern Nebraska eastward to the Atlantic coast from Staten Island southward. **Type Locality:** West bank of Missouri River, near Blair, formerly Engineer Cantonment, Washington County, Nebraska.

General description: A very small, dark brown shrew, with gray underparts. It is distinguishable from all other shrews by its minute size and short tail. It also has this distinction in dentition from the larger short-tailed shrew (*Blarina*) which occurs in the Chicago Area, in that it has only four upper unicuspid teeth rather than five, the fourth of which is so small as to be very difficult to see.

Measurements: Length 70-79, Tail 15-18.5, Hind foot 11-12.

Dentition of Genus: I. $\frac{3-3}{2-2}$ C. $\frac{1-1}{0-0}$ Pm. $\frac{2-2}{1-1}$ M. $\frac{3-3}{3-3} = 30$

Habitat: Open fields where there is long grass to furnish cover, frequently in localities combining brush with grass. Seldom occurs even in open woodland.

Habits: As far as known, similar to the habits of other shrews.

Food: Insects.

Young: I have no information as to the young.

Local Distribution: Said to be common in the southern and central part of Illinois and recently working into the northern part of the state, as well as northern Indiana and southern Michigan.

Records.

ILLINOIS. COOK: Homewood, 2 F.
INDIANA. PORTER: N.M.

SHORT-TAILED SHREW

Blarina brevicauda talpoides (Gapper)

Sorex talpoides Gapper, 1830 Zool. Journ. vol. 5, p. 202.
Blarina brevicauda talpoides Bangs, 1902 Proc. N. E. Zool. Club, vol. 3, p. 75.

Range: Upper Austral and Transition Zones, east of the Mississippi, to the Atlantic coast, penetrating a distance into lower edge of Boreal. **Type Locality:** Between York and Lake Simcoe, Ontario, Canada.

General description: Considerably larger and stockier than the Small Short-tailed Shrew, of a dark slaty gray color above, with lighter underparts.

Dentition of Genus: I. $\frac{4-4}{2-2}$ C. $\frac{1-1}{0-0}$ Pm. $\frac{2-2}{1-1}$ M. $\frac{3-3}{3-3} = 32$

Measurements: Limits taken from averages compiled from measurements of several different series: Male, Length 111-130, Tail 20-26, Hind foot 15-18; Female, Length 115-131, Tail 22-28, Hind foot 14-16.

Habitat: Generally speaking, it prefers deciduous woods and open fields, though I have seen it in the mixed forest of the Upper Peninsula of Michigan.

Habits: Similar to those of other shrews. On a hot summer day at our home in Northfield Township, Cook County, Illinois, one of the dogs captured

a Short-tailed Shrew which we rescued, apparently unharmed. It was placed in a pan with sides high enough to prevent escape, given some bacon and moved into the sun to be photographed. The bacon was eagerly devoured, but before long the shrew was seized with a fit and rolled over and over very rapidly for several seconds, perhaps half a minute, then lay on its side and stiffened out, quivering. A short session in the shade and a dash of cold water soon brought it around and when released it scuttled off as though none the worse for its experience.

I have on several occasions had a glimpse of the Short-tailed Shrew, once on a trail in the jackpines near the shore of Lake Superior in the Upper Peninsula of Michigan and again hurrying across the sand beach within a few yards of the edge of the lake itself, but never a more satisfactory view than on the occasion of a walk with Dr. W. H. Osgood through the woods in this same general locality in Marquette County, Michigan, on May 27, 1932. We had had a stretch of hot weather and on the 26th the wind came strong out of the northeast, bringing rain with it. A fine, steady drizzle continued on the 27th. It let up late in the afternoon and at about 4:30, as we walked along an old lumber road on a rocky ridge a mile or so from the shore of one of our typical, small, inland lakes, we came on two of these little shrews at close range. They were foraging. Their motions were lightning fast and they covered the ground rapidly, poking vigorously under leaves in search of insects, turning this way and that, tumbling over twigs and stems. We thought they might come together and watched for interesting developments, but their courses did not bring them within five feet of each other. Relying on their poor sight, we moved close. The nearer of the two found food and ate rapidly, using its forefeet to assist in the operation. It came up to Dr. Osgood's shoe, looked under the toe, followed along the edge of the sole the full length of the shoe, occasionally aiding its progress with one foot on the shoe, and then continued on its hunt, undisturbed. We stamped two or three times, rapidly, and squeaked and the shrew dashed under the leaves, returning our squeaks. We approached the second shrew and squeaked again, whereupon it also retired hastily, but in silence.

Food: Worms, insects, meat and to some extent grain.

Young: Two or three litters, averaging five in each litter.

Local distribution: Quite common throughout the Chicago Area. Most of the records are from Lake County, Illinois, where Mr. J. J. Mooney has recently taken a long series. The first record is from Kennicott, taken in West Northfield, Cook County, catalogued in 1855 and bearing the U. S. National Museum number 624/1775.

Records.

ILLINOIS. COOK: Calumet City, A; Chicago 7 F; Elk Grove, A; Elmwood Park, A; Forest View, A; Glencoe, 2 A; Homewood, 2 F, A; Lemont, A; Mt. Clair, A; New Lenox, A; Palos Park, A; River Forest, A; Worth, F; DE KALB: Somonauk, A; DU PAGE: Glen Ellyn, G; KANE: Bowes, A; Sugar Grove, A; LAKE: Camp Logan, 6 F; Deerfield, 3 A; Fox Lake, 18 F; Grayslake, A; Highland Park, 11 A; Prairie View, 3 A.
INDIANA. LAKE: St. John, A; PORTER: Hebron, 2 N.M.; Illinois, F.

LITTLE BROWN BAT

Myotis lucifugus lucifugus (LeConte)

V[espertilio] lucifugus Le Conte, 1831 *McMurtries Cuvier, Animal Kingdom*, vol. 1, p. 431.
Myotis lucifugus lucifugus Miller, 1924 *List North Amer. Recent Mamm.* 1923 *Bull. U. S. Nat. Mus.* No. 128, p. 68.

Range: The entire forested portion of North America, north of the southern boundary of the United States, except in the Rocky Mountain region and on the Pacific Coast of California, Oregon, Washington, British Columbia and southern Alaska. **Type Locality:** Georgia, probably the LeConte plantation, near Riceboro, Liberty County.

General description: A rather small bat, dull brown in color, with lighter underparts.

Measurements: Length 85.3-89.5, Tail 37.2-40, Hind foot 7.3-9.1, Ear meatus 12.2-13.7.

Dentition of Genus: I. $\frac{2-2}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{3-3}$ M. $\frac{3-3}{3-3}$ = 38

Habitat: Caves whenever available, otherwise hollow trees or any sort of sheltered nook.

Habits: Bats are uniformly nocturnal and crepuscular. They fly rapidly in search of food and their darting, sustained flight is familiar to all of us. I think it is not known definitely that they hibernate, though they do apparently become dormant in cold weather. They have very thin, high pitched, squeaky voices. They habitually hang upside down when they find a resting place for a long nap during daylight hours.

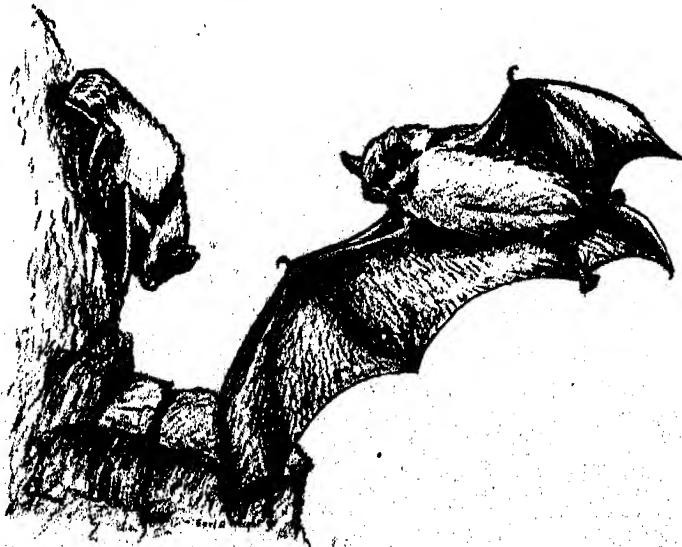
Food: Insects.

Young: It is supposed that this bat has but one young at each birth.

Local distribution: There are comparatively few actual specimens taken in the Chicago Area.

Records.

ILLINOIS. COOK: Chicago, 3 F; Evanston, MCZ; DU PAGE: Naperville, 2 A; KANE: Sugar Grove, 7 A; LAKE: Waukegan, 2 F.



TROUESSART'S BAT

Myotis keenii septentrionalis (Trouessart)

Vespertilio gryphus var. *septentrionalis* Trouessart, 1897 Catal. Mamm. v. v. foss., p. 191.
Myotis keenii septentrionalis Miller & Allen, 1928 U. S. Nat. Mus. Bull. 144, pp. 30, 105, 106, 1928.

Range: Eastern North America from Newfoundland and Quebec south to Tennessee and South Carolina; west to North Dakota, Missouri and Arkansas. **Type Locality:** Halifax, Nova Scotia.

General description: Differs from the Little Brown Bat in that its ears when laid forward extend beyond the end of its nose.

Measurements: Length 73, Tail 36, Hind foot 8.2, Ear meatus 18.7.

Habitat: Same as Little Brown Bat.

Habits: Similar to Little Brown Bat.

Food: Insects.

Young: All the bats of this genus are thought by Anthony (1928) to have but one young at a birth.

Local distribution: According to the best information available, it is very widely distributed throughout the Chicago Area, but has practically never been taken by collectors.

Records.
ILLINOIS. COOK: Chicago, F.

SILVER-HAIRED BAT

Lasiorycteris noctivagans (LeConte)

V[espertilio] noctivagans LeConte, 1831 McMurtries Cuvier, Animal Kingdom, vol. 1, p. 431.
Lasiorycteris noctivagans H. Allen, 1894 Monogr. Bats N. Amer., p. 105.

Range: North America, north of Mexico, from the Atlantic to the Pacific; probably not breeding south of the Transition Zone. **Type Locality:** Eastern United States.

General description: A bat with short, broad ears, dark brown in color, the fur tipped with silver or ashy white.

Measurements: Limits taken from averages compiled from measurements of several different series: Length 95-105.8, Tail 32.5-44, Hind foot 7-8.9, Ear meatus 15.4-16.

Dentition of Genus: I. $\frac{2-2}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{2-2}{3-3}$ M. $\frac{3-3}{3-3} = 36$

Habitat: Hollow trees, dense foliage and caves, preferably along the banks of water courses or on the edge of groves of trees.

Habits: It seems to enjoy flying over the water in search of its insect food. It comes out of its daytime hiding place at dusk and is busily engaged in the air during the night. When cold weather comes on, it migrates from those parts of its range subjected to cold and rigorous climate.

Food: Insects.

Young: One litter of one or two young.

Local distribution: This particular bat is very widely distributed; more abundant during spring and fall migration.

Records.
ILLINOIS. COOK: Chicago, 16 F, 5 A; Evanston, 2 A; LAKE: Beach, 2 F; Highland Park, F; DU PAGE: Milton Twp., G; Glen Ellyn, F.
INDIANA. PORTER: Wilson, F.

BIG BROWN BAT

Eptesicus fuscus fuscus (Beauvois)

Vespertilio fuscus Beauvois, 1796 Catal. Raisonné Mus. Peale, Philadelphia, p. 18 (P. 14 of English edition by Peale and Beauvois).
Eptesicus fuscus fuscus Miller, 1924 List North American Recent Mamm. 1923, Bull. U. S. Nat. Mus. No. 128, p. 76.

Range: Austral, Transition and lower edge of Boreal zones, throughout the greater part of the United States and adjoining British provinces. **Type Locality:** Philadelphia, Pennsylvania.

General description: Another bat with short ears, brown in color with the tip of its tail extending slightly beyond the interfemoral membrane.

Measurements: Limits taken from averages compiled from measurements of several different series: Length 108.5-116, Tail 42-47.5, Hind foot 9.2-10.4, Ear meatus 17-19.5.

Dentition of Genus: I. $\frac{2-2}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{1-1}{2-2}$ M. $\frac{3-3}{3-3} = 32$

Habitat: Water courses, meadows and open spots in the woods.

Habits: Quite similar in habits to the other bats, although it is said not to care so much for caves. It comes out quite early in the evening and pursues its tireless flight in search of insects. While it is thought that some of these bats may migrate from the colder sections of their range, others undoubtedly remain and hibernate to some extent. This is substantiated by Mr. Mooney's record of Jan. 21, 1930.

Food: Insects.

Young: One litter of one or two young.

Local distribution: This is about the commonest of the larger bats of the United States and is very widely distributed throughout its range.

Records.

ILLINOIS. COOK: Chicago, F; KANE: Sugar Grove, 14 A; LAKE: Lake Bluff, A.

RED BAT

Lasiurus borealis borealis (Müller)

Vespertilio borealis Müller, 1776 Natursyst. Supp. p. 20.
Nyctotis borealis borealis Müller, 1924 List of North American Recent Mamm., 1923, Bull. U. S. Nat. Mus. No. 128, p. 78.
Nyctotis=*Lasiurus*, Internat. Comm. Zool. Nomenclature, Opinion 111, 1929.

Range: Boreal, Transition and Austral zones in eastern North America from Canada to Florida and Texas; west at least to Indian Territory and Colorado. **Type Locality:** New York.

General description: A bat of bright reddish brown color, somewhat lighter in shade on the underparts. Its interfemoral membrane is heavily furred. The coat has the appearance of being lightly frosted because of occasional hairs with very small white tips scattered throughout the coat.

Measurements: Limits taken from averages compiled from measurements of several different series: Length 103-110, Tail 47.5-52.7, Hind foot 7.2-7.9, Ear meatus 10.5-11.9.

Dentition of Genus: I. $\frac{1-1}{3-3}$ C. $\frac{1-1}{1-1}$ M. $\frac{2-2}{2-2}$ Pm. $\frac{3-3}{3-3} = 32$

Habitat: Trees and bushes.

Habits: Similar to those of other bats.

Food: Insects.

Young: One litter numbering from one to four young.

Local distribution: One of the most common bats, found throughout the area. More abundant during migration.

Records.

ILLINOIS. COOK: Chicago, 17 F, 6 A, G; Evanston, A; LaGrange, A; Maywood, F; Niles Center, F; Willow Springs, F; DU PAGE: Glen Ellyn, 2 G; Naperville, A; LAKE: Highland Park, M; Lake Forest, F.

HOARY BAT

Lasiurus cinereus (Beauvois)

Vespertilio cinereus (Misspelled *linereus*) Beauvois, 1796 Catal. Raisonné Mus. Peale, Philadelphia, p. 18 (P. 15 of English edition by Peale and Beauvois).

Nycterus cinereus Hollister, 1910 Bull. Wis. Nat. Hist. Soc., vol. 8, p. 30.

Range: Boreal North America, from Atlantic to Pacific, breeding within the Boreal Zone, but in autumn and winter migrating at least to southern border of United States. **Type Locality:** Philadelphia, Pennsylvania.

General description: Somewhat larger than the Red Bat, of gray color with wide ears and interfemoral membrane furred above. Underparts lighter, tending more toward yellow.

Measurements: Limits taken from averages compiled from measurements of several different series: Length 134.5-140, Tail 52-58.5, Hind foot 9-10, Ear meatus 17-18.

Habitat: This bat, like the Red Bat, lives in trees.

Habits: It migrates in the spring and fall. It has a swift, erratic flight and does not come out as early in the evening as some of the other bats.

Food: Insects.

Young: Two to four.

Local distribution: Occurs occasionally throughout the area.

Records.

ILLINOIS. COOK: Chicago, 4 F; Flossmoor, 3 F; Maywood, 3 F; Highland Park, M.

RAFINESQUE'S BAT

Nycticeius humeralis (Rafinesque)

Vespertilio humeralis Rafinesque, 1818 Amer. Monthly Mag. Vol. 3, p. 445.

Nycticeius humeralis Miller, 1924 List North American Recent Mamm. 1923, Bull. U. S. Nat. Mus. No. 128, p. 80.

Range: Austral Zone in the eastern United States, west to Arkansas and Southern Texas.

Type Locality: Kentucky.

General description: A rather small bat, with fairly small ears, dull brown in color, with lighter underparts, tip of tail extending beyond interfemoral membrane.

Measurements: Limits taken from averages compiled from measurements of several different series: Length 91.4-93.5, Tail 35.8-37.2, Hind foot 6.7-7.7, Ear meatus 12.7-13.9.

Dentition of Genus: I. $\frac{1-1}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{1-1}{2-2}$ M. $\frac{3-3}{3-3} = 30$

Habitat: Similar to other bats described.

Habits: Very little is known about the habits of these bats. They come out at the end of the daylight hours to commence their tireless search for food.

Food: Insects.

Young: Probably two to four.

Local distribution: They probably occur almost entirely in the southerly part of the area. Site of the record here listed is characterized by Sanborn (1930) as the most northerly locality for its occurrence in Illinois.

Records.

ILLINOIS. Cook: Chicago, 1 F.

UPPER MISSISSIPPI VALLEY RACCOON

Procyon lotor hirtus Nelson and Goldman

Procyon lotor hirtus E. W. Nelson and E. A. Goldman, 1930, Journal of Mamm., vol. 11, p. 455.



Range: Upper Mississippi and Missouri River drainage areas from the eastern slopes of the Rocky Mountains east to Lake Michigan, and from southern Manitoba south to Oklahoma. **Type Locality:** Elk River, Sherburne County, Minnesota.

General description: A short, stocky mammal of a general yellowish gray color, with a black mask across forehead and eyes and a dozen or so alternate rings of gray and black on its bushy tail.

Measurements: Length 880, Tail 265, Hind foot c. u. 125.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{4-4}{4-4}$ M. $\frac{2-2}{2-2} = 40$

Habitat: Wooded regions almost exclusively. It never gets far from the trees, preferably near water courses of some sort. It makes its home in hollow trees or logs.

Habits: The raccoon is strictly nocturnal in habit and a ready tree climber. In the northern part of its range it hibernates during the cold months of the year. It seems to be quite generally believed that this mammal washes its food whenever possible before eating it.

Food: It is practically omnivorous, although it seems to be especially fond of frogs, crustaceans and other forms of animal life found along the shores of water courses. It also eats fruits, birds, birds' eggs, mammals, and is very fond of green corn.

Young: Three to six in one litter, born in the spring.

Local distribution: It was widely distributed throughout the area years ago but seems to be diminishing in numbers.

Records.

ILLINOIS. COOK: Chicago, F; Wheeling, M; WILL: Joliet, F; Lockport, A.
INDIANA. PORTER: F.

LEAST WEASEL

Mustela rixosa allegheniensis (Rhoads)

Putorius allegheniensis Rhoads 1901, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 751.
Mustela rixosa allegheniensis Swenk, 1926, Journ. Mamm., vol. 7, p. 328.

Range: From Virginia and New York west to Wisconsin; exact limits of range unknown.
Type Locality: Near Beallsville, Washington County, Pennsylvania.

General description: Distinguished from all other weasels by its very short tail and the absence of a black tip to its tail. The Least Weasel is the smallest of our weasels. Its summer coat is dark brown above with white underparts, and its winter coat is entirely white. The female is very much smaller than the male.

Measurements: Female, Length 150, Tail 31, Hind foot 20-22 (dry); Male, Length 187-202, Tail 25-36, Hind foot 20-30.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{3-3}$ M. $\frac{1-1}{2-2} = 34$

Habitat: It generally lives in the woods or brushy country, where it can get plenty of shelter and makes its home in hollows in stumps or logs, under logs and brush piles and rocks.

Habits: It is tremendously active and energetic. It is strictly carnivorous and a ferocious hunter, active day and night, though mostly at night. It does not hibernate. It does not do the damage in chicken yards frequently accomplished by the larger weasels.

Young: The young are generally from four to six to a litter.

Food: Birds and small mammals, principally mice.

Local distribution: Although it has been for years supposed to occur in the Chicago Area, it was not until very recently that actual records were procured. Since 1927 it has apparently been increasing rapidly, judging by the numerous specimens procured.

Records.

ILLINOIS. COOK: LaGrange, A; Niles Center, 3 A; Northfield Twp., F; LAKE: Beach, F; Deerfield, F, A, 2 M; Gilmer; Grayslake, A; Highland Park, 2 M; Waukegan, 2 A; Zion, A.

NEW YORK WEASEL

Mustela noveboracensis noveboracensis (Emmons)

Putorius noveboracensis Emmons, 1840, Rep. Quadr. Massachusetts, p. 45.

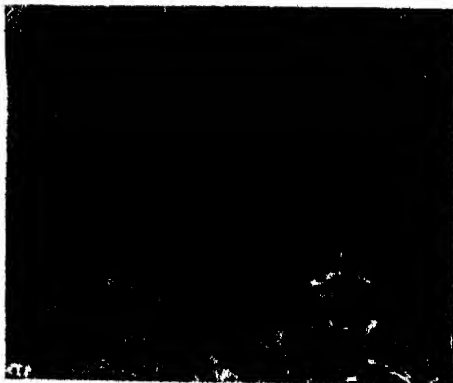
Mustela noveboracensis noveboracensis Miller, 1912, North Amer. Land Mamm., 1911, p. 97.

Range: Eastern United States from southern Maine south at least through the Transition Zone and west to Illinois. **Type Locality:** Southern New York.

General description: Dark brown above, with white underparts and long tail. The tip of the tail is black, the black extending about one-third of the length of the tail. In this species the male is very much larger than the female. In winter, in all but the most southerly part of its range, this weasel turns white, except for the tip of the tail, which remains black.

Measurements: Male, Length 407, Tail 140, Hind foot 47; Female, Length 324, Tail 108, Hind foot 34.5.

Habitat: An inhabitant of the woods, making depredations after mice in open fields and sometimes causing havoc in the chicken yard. It lives in hollow logs and stumps and among rocks.



Habits: These weasels are inveterate killers. It seems to be quite generally accepted that they kill at times for the lust of killing, without reference to the exigencies of appetite.

I found characteristic weasel tracks in a light snow, February 25, 1928, in our woods in Northfield Township. By back tracking, the home of the weasel was located in a hollow stump. His method of ingress and egress was by way of a ramp reaching from the ground up the side of the remnants of this old stump from the top of which he could drop easily a few inches to the ground inside the stump. The top was open and I saw no sign of a nest. That night I set out at the foot of the stump a freshly caught White-footed Mouse. The weather was moderating rapidly and the temperature rising from the minimum of 5°F. recorded the day before. Fresh weasel tracks appeared the next morning and the mouse was gone. The night of the 26th the set-camera was put in place, baited with a White-footed Mouse killed six days before, still in fairly good condition. The mouse was opened up and laid on its back. The temperature that night was still below freezing. At 10:30 P. M. I heard the flash. The resulting picture was highly unsatisfactory, but interesting in showing the weasel leaping through the air from the top of the ramp towards the bait. Two more mice were caught on the 27th and one placed by the weasel den after midnight. It was still there the next morning. February 28th was like a spring day, the temperature well above 50°. When I reset the camera that evening the mouse was gone. The second mouse was put in place as bait and the set completed soon after 9 P. M. By this time practically all the snow had melted away from around the stump. It was a clear night, with the moon at first quarter. At 11 o'clock the bait was still untouched, but at 2 A. M. of the 29th, the flash was heard. By 10 o'clock that night the temperature was below freezing again. Mouse trapping was unsuccessful during the next twenty-four hours. It appeared to me that the weasel always took the same course along the foot of the stump, and in the absence of fresh, attractive bait I stretched a trip-wire across this course. The set was in order by 9:30 P. M. of the 29th, and the weasel came by and tripped the flash at one o'clock on the morning of March 1st. March 1, I experimented with a section of fresh perch bait. It was a fine, clear night, the temperature above freezing, but nothing took my bait. At 9 P. M. on March 2nd, the camera trap was once more set with White-footed Mouse bait. No change in the weather. 12:45 A. M., March 3rd, the sound of the flash awakened me. After each of the pictures taken at this set, the disappearance of the bait and the position of the wire by which it was fastened to my trip indicated that the weasel had dragged his find into his den before disposing of it. I never found any mouse remains.

Being in some doubt as to whether or not I was photographing more than the one individual, and anxious to get some indication as to the dimensions of the subject, on the night of March 3rd I hung my bait, again a White-footed Mouse, on the side of the stump, its nose 8½ inches from the ground, and left the set in order at ten o'clock. On the morning of March 4th, I found the trap sprung, and the mouse gone. I had hoped the weasel would reach for

the bait from the ground. Instead of that, he twisted around and took it from the ramp.

Again I hung my bait on the stump, this time moving it away from the ramp, its nose nine inches from the ground. Again the weasel refused to reach up, and succeeded in stealing my bait from above, showing only his head in the resulting picture.

On March 5th no mouse was available for bait. I used raw beefsteak and hung it with the top 5½ inches from the ground. Shortly before 3 A. M. March 6th, the flash was heard again for the first time in three nights. Again my experiment failed and again the weasel took the bait from above, although it necessitated his hanging down most of his length to reach it. That was my last shot. I continued baiting at this stump for several nights with fresh meat and White-footed Mice and House Mice, but the weasel had gone.

I have seen weasels in the daytime, but I think they move around more at night than in the hours of daylight. They do not hibernate.

Young: One litter of from 4 to 8.

Food: Mostly small mammals and to some extent birds.

Local distribution: This weasel appears to occur in all parts of the Chicago Area although most of the records come from Lake and DuPage counties, Illinois.

Records.

ILLINOIS. COOK: Evanston, A; Flossmoor F; Glencoe, F; Niles Center, A; Wheeling, A; Du PAGE: Bloomingdale Twp., 6 G; Milton Twp., 37 G; LAKE: Camp Logan 3 F; Deerfield, A, M; Fort Sheridan, F; Highland Park, 3 A, M; Pistakee Lake, A; WILL: G, Joliet A. INDIANA. LAKE: Liverpool G.

COMMON MINK

Mustela vison mink Peale and Beauvois

Mustela mink Peale and Beauvois, 1796, Cat. Peale's Mus., Philadelphia, p. 39.
Mustela vison mink Hollister, 1914, Proc. Biol. Soc. Washington, vol. 27, p. 215.

Range: Eastern United States, from coast of New England, south to North Carolina, and, in the interior, to central Georgia and Alabama; westward through southern Pennsylvania and Ohio to Missouri and northeastern Texas. *Type locality:* Maryland.

General description: A dark brown fur bearer, of structure similar to other members of the weasel family, but larger and with bushier tail than the weasel proper. It differs from the weasel in that its underparts are of the same color as the upperparts, with the exception of a white spot on the chin and sometimes an irregular white spot on the breast or elsewhere on the underparts and also in that unlike the weasel it does not turn white in the winter time. Slightly smaller and darker than the Mississippi Valley Mink.

Measurements: Length 500-627, Tail 178-209, Hind foot 63-70.

Habitat: It lives near lakes, streams and ponds, and may be found in open country as well as in the woods. It makes its home in a burrow in the ground, in hollow logs, or in the base of hollow stumps.

Habits: The mink is a great hunter. It is about as much at home in the

water as on land. It is a skillful fisher, although its diet is by no means restricted to fish. It does not hibernate.

Food: The mink is distinctly carnivorous and in addition to any fresh meat that it can catch, eats fish, frogs and crustaceans.

Young: One litter of from three to ten in a season.

Local distribution: The Chicago Area is undoubtedly in an area of intergradation of this species with the Mississippi Valley Mink (*Mustela vison letifera*) but without further material it seems advisable to list these two different species as occurring here in reliance upon records in hand. It has been suggested by A. H. Howell that probably the Indiana-Illinois State line is the approximate dividing line between the ranges in the Chicago Area of the Common Mink and the Mississippi Valley Mink and that those occurring east of this line should be referred to *mink* and those west to *letifera*.

Records.

INDIANA. PORTER: N. M.



MISSISSIPPI VALLEY MINK

Mustela vison letifera Hollister

Mustela vison letifera Hollister, 1913, Proc. U. S. Nat. Mus., vol. 44, p. 475.

Range: From northern Wisconsin and northern South Dakota south to northern Illinois, northern Missouri and southern Kansas. **Type Locality:** Elk River, Sherburne County Minnesota.

General description: Similar to the Common Mink, but slightly larger and lighter in color.

Measurements: Length 660.4, Tail 238.76, Hind foot 73.66

Habitat: Same as Common Mink.

Habits: As far as I know, the habits of this mink do not differ from those of the common mink.

My brother saw one in the lights of his car on the driveway of our home in Northfield Township, Illinois, at least a quarter of a mile from the nearest water, but not over 100 yards from the chicken house.

Once we placed on a sand beach, ten feet or so from the water's edge, a two pound pickerel, being careful not to touch it with our hands. The next day it had been dragged off and fresh mink tracks showed. A couple of nights later, another fish was similarly placed as bait for the set-camera. The mink came at about eleven o'clock at night and at the explosion of the flash, escaped directly into the lake by the shortest route and in the longest possible jumps. The mink did not appear to be shy of human scent, yet I have had them pass within a few inches of fresh, attractive bait such as fish or mouse, and ignore it completely.

I have found one asleep in the sun on the bushy shore of a small island near an active loon's nest. The bow of the boat scraping the bushes awakened him and made him look up. He did not wait long.

I have thought from the occasions when I have seen periodic recurrence of fresh mink tracks at intervals of several days in the same place, that at least some minks cover a course of several miles in their wanderings in search of food. The skill with which a mink can hide when following a watercourse, scurrying along the bank much of the time, diving again and again into the water, is quite remarkable. One eluded me this way, almost at my feet, on a chill November day, when the air was full of snow. It reappeared farther down stream, but whether it progressed from its hiding place along the undercut bank or in the water itself, I could not tell.

Again, drifting quietly down-stream in a canoe, I was vouchsafed a brief but interesting glimpse. A mink came to the water's edge, not far from the bow of my craft, with a mouse in its mouth. A quick survey satisfied it that the situation was not favorable. Quickly it darted back into the brush, left its catch and reappeared almost at once for further observations. As I drifted away, I saw it once more over my shoulder come again to the water, mouse in jaws, and swim for the far bank. This was in mid-summer.

I have had some interesting experiences in attempting to photograph minks with the set-camera. Once one of them crouched on the shore of an inland lake, crunching a crawfish. The meal finished, it opened wide its jaws and repeated the process several times, as though stretching them to dislodge a bit of scale or bone.

Food: Same as that of the common mink.

Young: As with the common mink, as far as I know.

Local distribution: West of the Illinois-Indiana state line.

Records.

ILLINOIS. COOK: Evanston, 3 A; Orland, 2 F; DU PAGE: Addison Twp., G; Bloomingdale Twp., 3 G; Milton Twp., 3 G; KANE: Geneva, 2 A; St. Charles 3 B. S.; 2 N. Y.; LAKE: Deerfield, 2 A, F; Grayslake, A.

MINNESOTA SKUNK

Mephitis mephitis minnesotae Brass

Mephitis minnesotae Brass, 1911, Aus dem Reiche der Pelze, p. 532.

Mephitis mephitis minnesotae Jackson, 1914, Bull. Wisconsin Natural History Society, vol. 12, p. 25, 36.

Range: Limits undetermined. **Type Locality:** Forested region of Minnesota.

General description: A short-legged, stocky animal with long, very bushy, heavy tail and rather small head. It is black, with two white stripes extending from the nape of the neck along the edges of the back to the base of the tail. The tail is also striped with white, and there is a white stripe down the middle of the face. These white marks vary a great deal. I have one picture of a skunk in which the stripes on the back hardly come beyond its shoulders and the only visible white on its tail is at its tip. It is more noted, perhaps, for the scent which it is able to expel than for any other single character. This skunk is larger than the Illinois Skunk.

Measurements: Probably about the same size as the Northern Skunk, which Cory gives for the male: Length 672-750, Tail 242-279, Hind foot about 82. Female: Length 572-660, Tail 235-260, Hind foot about 76. (Cory, 1912, p. 340.)

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{3-3}$ M. $\frac{1-1}{2-2} = 34$

Habitat: We may expect to find skunks in almost any part of our area where there are pastures or woodlands or brushy river banks. They live in a hole in the ground which they may dig themselves, although they are not at all reluctant to appropriate for their own use holes dug by other mammals. I have found them on occasion living in an abandoned fox burrow.

Habits: The skunk is slow moving, having abundant confidence in its ability to take care of itself because of its effective defense weapon, namely the powerful scent which it can discharge at will, and with considerable accuracy. It eats a great many insects and is also a scavenger. Although more active at night and during the hours of dusk and dawn, I have seen it many times in broad daylight and have watched it approach to within a few feet of where I was standing, rooting about with its forefeet and nose in search of food, much after the manner of a little pig. Its gait is a curious sort of gallop. In cold weather the skunk is generally dormant, though it does not hibernate profoundly. Even when there is a considerable depth of snow lying on the ground in midwinter, its tracks may be seen whenever a warm, pleasant day and night comes along.

It is of phlegmatic disposition and a voracious feeder. I have had it trip my camera set many times when the set was baited for other mammals. When visiting the camera the next day on such occasions and sometimes the same day within half an hour or so of the flash, I have never noticed any aroma indicating that the skunk had been sufficiently startled to leave its well known secretion.

Most mammals are considerably alarmed at the explosion of the flash which is always used to furnish the light for night pictures with set-camera. I remember the performance of one skunk in particular. It was plain from

the tracks that it had not run away at the flash. The bait used was an ordinary House Mouse flavored with beaver castor wired to a long buried cable extending back to the battery connection of our apparatus. A pull on the mouse set off the flash, but the skunk evidently did not intend to be deprived of his meal. The light wire by which the mouse was tied held fast until the skunk had pulled up all of the buried cable and dragged the bait off eighteen or twenty feet from its original position. I found it thus the next morning.

Skunks come out to range so early in the evening that we have found it almost useless to have a set baited for other mammals once the skunks have discovered it.

Food: Insects and any fresh meat which it can catch, eggs, fish and carrion.

Young: One litter of four to six and sometimes more. Ten is the highest number recorded.

Local distribution: Skunks occur in considerable numbers throughout the area. The only specimens of the Minnesota Skunk were taken in Cook County, Illinois.

Records.

ILLINOIS. COOK: Chicago, 7 B.S.

ILLINOIS SKUNK

Mephitis mesomelas avia Bangs

Mephitis avia Bangs, 1898, Proc. Biol. Soc. Washington, vol. 12, p. 32.
Mephitis mesomelas avia Allen, 1901, Bull. Amer. Mus. Nat. Hist., vol. 14, p. 334.

Range: Prairie region of Illinois, western Indiana, and eastern Iowa; boundaries of range imperfectly known. *Type Locality:* San Jose, Mason County, Illinois.

General description: Smaller than the Minnesota Skunk, with a rather short tail, which is usually without any white marks.

Measurements: Male: Length 625-686, Tail 175-215, Hind foot 65; Female: Length 580-650, Tail 158-184, Hind foot 62.

As to habitat, habits, food and young, there is nothing to add in connection with this skunk to what has already been set out for the Minnesota Skunk.

Local distribution: It will be seen from the range as given that this skunk might be expected to occur in the prairie sections of the area rather than elsewhere.

Records.

ILLINOIS. COOK: Chicago, F; DU PAGE: York Twp., G; LAKE: Camp Logan, F; DEERFIELD, A; Highland Park, 2 F.



AMERICAN BADGER

Taxidea taxus taxus (Schreber)

Ursus taxus Schreber 1778 Säugethiere, vol. 3, p. 520.

Taxidea taxus taxus Miller, 1924, North Amer. Recent Mammals, 1923, U. S. Nat. Mus. Bull. 128, p. 142.

Range: From Northern Indiana west to the Sierra Nevada Mountains, south, at least to Kansas and New Mexico, north in the Saskatchewan region to about latitude 55; replaced in the South and West by allied forms. **Type Locality:** Labrador and Hudson Bay.

General description: One of the largest of the weasel family, heavy set, short-legged, with tremendous digging claws on the forefeet, a general grizzled appearance, black legs and a striking brown and white face. It has a very short tail.

Measurements: Length 691-741, Tail 125-136, Hind foot 95-105.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{3-3}$ M. $\frac{1-1}{2-2} = 34$

Habitat: Plains, prairies and to some extent the open woods.

Habits: It moves slowly, but hunts diligently for ground squirrels and other rodents, digging with great rapidity and efficiency. It is generally active at night. It lives in burrows, which it digs.

In attempting to photograph it in Montana with a set-camera, I soon discovered that a large mound of freshly turned up earth beside a burrow of liberal dimensions did not indicate that a badger was a resident, but merely that one had recently been there in search of food. To find it at home we discovered we must find a burrow entrance worn and smooth. It hibernates in cold weather.

Food: Mostly ground-squirrels and other rodents.

Young: One litter of one to five.

Local distribution: Formerly found in the northern part of the area. Used to be quite common in all but the southernmost part of the area. It then became scarce for years, but recently has been reappearing.

Records.

ILLINOIS. DU PAGE: Milton, G; LAKE: Halfday, 2 M.



EASTERN RED FOX

Vulpes fulva (Desmarest)

Canis fulvus Desmarest, 1820, Mammalogie, vol. 1, p. 203.
Vulpes fulvus DeKay, 1842, Zool. of New York, Mamm., p. 44.

Range: Northeastern United States. **Type Locality:** Virginia.

General description: One of the dog family; of small size, with big ears, yellowish brown in color, redder on the back. The Red Fox has considerable white on his underparts and black on the legs. It has a very bushy tail, tipped with white. The Black, Silver and Cross foxes are merely color phases of the Red.

Measurements: Length 965, Tail 286, Hind foot 146.4.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{4-4}{4-4}$ M. $\frac{2-2}{3-3} = 42$

Habitat: Woodland and prairie. It seems to like those sections of the woods where there are clearings and open spaces and only those prairies where it can find cover. It makes its home generally in a den dug into the ground.

Habits: The Red Fox is largely nocturnal, though it does move around in the daytime as well. It is wary and keen and one of the most alert of all our mammals in avoiding capture by man. It readily adapts itself to its surroundings and seems to get along quite well in sparsely populated sections of the country.

The most amusing story from an eye witness that I have heard, was told me by General Charles D. Herron of the United States Army. He and his wife enjoy riding to the hounds in Maryland. On one occasion when the hounds were being exercised by the master in a practice run, the General and Mrs. Herron did not follow them, but rode across country, stopping at likely spots where they might have a glimpse of the chase. While they stood watching on a woodland road, a fox came in sight, approaching the road. As he passed around a large tree, he was met face to face by a hound pup straying from the pack, which had lost the trail. The fox paid no attention to the dog, but continued his leisurely trot out onto the road and across. The pup was evidently uncertain as to his course of conduct, but made the best of the situation and fell in with the fox, trotting beside him. In the middle of the road, he happened to look up and see the spectators. Apparently he felt that considerable responsibility rested upon him and that the circumstances called for some show of authority on his part. He turned his head for an experimental nip at the fox. This was returned in kind. Whereupon the pup turned tail and dashed back for reinforcements, eventually putting the straying pack on the trail and leading them after the quarry. The fox took a leisurely course to a point of vantage across an open field and watched his back track until the dogs came in sight. He then trotted off to make good his escape.

The Red Fox is a most skillful hunter and remarkable in stalking his prey. Its boldness in raiding nearby chicken yards is too well known to need more than passing reference. It does not hibernate.

Food: Rabbits, squirrels, chipmunks and other rodents and birds. It is also said to eat birds' eggs and sometimes fruit.

Young: Four to nine, born in March or April.

Local distribution: Occurs sparingly throughout the area, except, of course, in the well-settled portions.

Records.

ILLINOIS. WILL: Joliet, F; Wilmington, F.

EASTERN GRAY FOX

Urocyon cinereoargenteus cinereoargenteus (Schreber)

Canis cinereo argenteus Schreber, 1775, Säugethiere, p. 92.

Urocyon cinereoargenteus cinereoargenteus Miller, 1924, North Amer. Recent Mammals, 1923, U. S. Nat. Mus. Bull. 128, p. 147.

Range: Found in eastern United States from Virginia north into New England and west to the Great Lakes region, south to meet the range of *floridanus*. Limits of range unknown. *Type Locality:* Eastern North America.

General description: A dog-like quadruped, with perhaps slightly longer legs than the Red Fox. Upper parts gray, some reddish-brown on sides of neck and sides and a band of the same color on the breast. Underparts whitish.

Measurements: Length 900, Tail 282, Hind foot 133.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{4-4}{4-4}$ M. $\frac{2-2}{3-3} = 42$

Habitat: More of a woods animal than the Red Fox and not nearly so likely to continue in residence near civilization. This may perhaps be due to the fact that the Gray Fox is easier to trap than the Red. It also lives in burrows in the ground.

Habits: Similar to the Red Fox, with the marked difference that the Gray Fox can climb trees with low hanging branches, and often uses this means of escaping the dogs when hunted. It is largely nocturnal, but may be seen sometimes during daylight hours. It is not as keen and wary as the Red Fox.

Food: Small rodents and other small mammals, birds, birds' eggs and sometimes fish and fruit.

Young: Four to six, born in March or April.

Local distribution: Very rare in any part of the Chicago Area.

Records.

ILLINOIS. LAKE: Deerfield, M; Ahrens collection.



NORTHERN COYOTE

Canis latrans Say

Canis latrans, Say, 1823, Long's Exped. Rocky Mts., vol. 1, p. 168.

Range: Humid prairies and bordering woodlands of the northern Mississippi Valley, in Iowa and Minnesota and northern edge of plains westward to the base of the Rocky Mountains in the Province of Alberta. **Type Locality:** Engineer Cantonment, near present town of Blair, Washington County, Nebraska.

General description: In appearance not unlike the Gray Wolf, except for size, though it has larger ears in proportion to the size of its head and a sharper muzzle. There is considerable color variation, of course, in the individuals, some being quite gray and others more tawny. The coyote is normally about one-third as heavy as a good sized Timber Wolf.

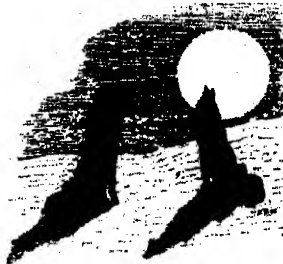
Measurements: Length 1110-1250, Tail 280-370, Hind foot about 190.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{4-4}{4-4}$ M. $\frac{2-2}{3-3}$ = 42

Habitat: This species is well known in the great prairies; also inhabits, apparently in increasing numbers, the heavy timber of the north woods. It makes its home, as a rule, in dens dug in the ground, although it may also use hollow logs and crevices in rocks.

Habits: A scavenger, as well as a hunter of live game. Active night and day. Being prolific, and not requiring nearly the amount of fresh meat needed by the large wolves, it is able to get along better near civilization. Not possessed of the courage, stamina, and intelligence of the Timber Wolves, yet crafty and clever in taking care of itself. Its yapping at night is a familiar sound. It does not hibernate.

Once I watched one hunting. I was one of a party on horseback. We were riding at an altitude of about 7700 feet in Gallatin County, Montana. Turning a stretch of lodgepole pine, we came into view of a small meadow. At the far edge of it, close to the woods, a coyote lifted its head. The wind was favorable to us. The animal was apparently an old individual, certainly an exceptionally large one. It was engrossed in its mouse-hunting. Ears up, nose to the ground, it crept stealthily forward a few inches at a time, then suddenly bowed its back, leaped straight into the air and came down on all fours, its forefeet on its prey—a sizeable dark-colored mouse. This it caught quickly in its mouth and adjusted satisfactorily for eating, with a toss or two of its head. We watched it stalk and pounce again, but this time it apparently missed, for it scratched around frantically, and we could not see that it caught



or ate anything. After a short turn into the edge of the woods, it came on straight towards us and continued its hunting. When we left, the coyote calmly watched us go and then moved slowly along by the edge of the woods. This incident occurred in the middle of the morning at the end of August.

Food: Small rodents and other mammals, including fawns and the young of live stock, as well as birds, eggs and all manner of carrion.

Young: Three to ten in litter, born in April or May.

Local distribution: Once plentiful throughout the area, then practically extinct, and only recently beginning to appear occasionally.

Records.

ILLINOIS. LAKE: Halfday, M; Lake Forest, A.

SOUTHERN WOODCHUCK

Marmota monax monax (Linnaeus)

[Mus] monax Linnaeus, 1758, Syst. Nat., ed. 10, vol. 1, p. 60.

Marmota monax monax Miller, 1924, North American Recent Mammals, 1923, U. S. Nat. Mus. Bull. 128, p. 173.

Range: Middle Eastern United States from Pennsylvania, New Jersey (?), Ohio, Indiana, Illinois, and Iowa, south to the northern parts of South Carolina, Georgia, Alabama and Arkansas; west to eastern Kansas. *Type Locality:* Maryland.

General description: A rugged, heavy-set member of the squirrel family, with blunt muzzle, short legs, short tail and heavy body. The color scheme is generally brown, considerably grizzled, the hairs on the back black at the base, the face and mouth with more or less gray.

Measurements: Male: Length 573-665, Tail 145-153, Hind foot 82-88. Female: Length 557, Tail 139, Hind foot 83.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{2-2}{1-1}$ M. $\frac{3-3}{3-3}$ = 22

Habitat: It lives in fields and open woods, making its home in burrows that are frequently joined together with a series of entrances and exits.

Habits: Woodchucks move about and do their feeding for the most part early in the morning and late in the afternoon. They are largely diurnal in habit. Woodchucks have some ability to climb trees, which they occasionally exercise. Being somewhat slow of movement, they seem to feel that it is necessary to be continually on the alert. Frequently, while they are feeding, they may be seen standing straight up stretching their necks, looking all about them. Their natural timidity does not prevent them from being great fighters when they are cornered.

In April and May of 1931, I spent two days photographing woodchucks with the set-camera at the Combs farm, Grayslake, Lake County, Illinois. On April 12th I observed that the woodchucks fed close to their burrows and did not move around much. On May 4th, although the temperature was lower than it had been on the 12th of April, the woodchucks seemed much more active and briskly covered several hundred yards in their wanderings in search of food. Their conduct was in marked contrast with the slow, cautious movements of the animals observed in April.

Woodchucks hibernate in winter. I made the following notes of a third trip to the same farm March 20, 1932. "Reached there shortly before ten

A. M. to see woodchuck, young, last year's male. He was found at bottom of hay pile, twenty feet or so from edge, under bottom rail of rail fence, near barn. Found by a boy in employ of Combs' tenant, Henry Behm, shortly before new year. He was kept in straw in metal barrel in barn. Behm reported that on warm days of January and February, woodchuck had eyes open and was quite lively. We had him out in bright sun until about 10:45, photographing him. Could not feel heart beat. Respiration slow and irregular. Nose dry and cold, body cold, eyes closed; animal curled up with head bent over chest; forefeet by eyes, hind feet pulled up; tail straight along ventral surface toward head; quite stiff and resistant to efforts to straighten him out, expressing disapproval of this with occasional squeaky grunts. Held, back down, in hand, fulcrum middle of back, he slowly straightened out until head hung downward, mouth open. When set down, curled up again immediately. Lower incisors well developed. Only right upper incisor visible and it was square and blunt and hardly clear of lip. Placed on straw in paper bag, covered with straw, was wide awake, belligerent and shivering after 25 mile drive in sedan 12:15 P. M. When working or chattering teeth, lower incisors frequently separated distinctly from each other throughout visible length. Light covering of inch or so of snow on ground. Sky overcast by 12:15 and wind chilly. Temperature Northwood, Cook County, 8:30 A. M. about 28°, 2 P. M. 35°."

Food: A strictly vegetarian diet, consisting largely of grass and clover with some other vegetables and grain.

Young: Single litter of four to eight.

Local distribution: Scattered throughout entire area.

Records.

ILLINOIS. COOK: Lemont, A; Chicago, A; Willow Springs, F; DE KALB: Somonauk, A; DU PAGE: Bloomingdale Twp., G; Milton Twp., G; KANE: St. Charles, A; LAKE: Fox Lake, 3 F; Fremont Twp., A; Lake Forest, F.
INDIANA. PORTER: Mineral Springs, F.



FRANKLIN GROUND-SQUIRREL

Citellus franklinii (Sabine)

Arctomys franklinii Sabine, 1822, Trans. Linn. Soc. vol. 13, p. 587.

Citellus franklinii Miller, 1924, List of North American Recent Mamm., 1923, U. S. Nat. Mus. Bull. 128, p. 187.

Range: From the Saskatchewan Region southeast over the Red River and Mississippi valleys to eastern Nebraska and Kansas to Central Missouri, extending eastward as far as northwestern Indiana. Includes within its range the whole of Iowa, northern Missouri, northern two-thirds of Illinois, a small portion of northwestern Indiana, southern and western Wisconsin and at least the southern and western half of Minnesota. **Type Locality:** Vicinity of Carlton House, Saskatchewan, Canada.

General description: A good sized ground-squirrel, without stripes, brownish gray in general appearance, frequently giving the impression of being to some extent spotted with dark spots.

Measurements: Length 380, Tail 120.6, Hind foot 47.6.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{2-2}{1-1}$ M. $\frac{3-3}{3-3} = 22$

Habitat: It inhabits bushy margins of woodland and lives in a burrow, sometimes near a stream or water course and sometimes in the open fields.

Habits: It is diurnal and lives in colonies. These colonies from season to season wander considerably from place to place. Food is stored up in the burrows and the occupants hibernate during the winter months.

Food: It is to some extent carnivorous, though its principal food consists of grasses, seeds, grain and roots.

Young: One litter of five or six young, sometimes more.

Local distribution: It has at various times occurred throughout the area, although it is not at all plentiful now in Indiana.

Records.

ILLINOIS. COOK: Barrington, A; Lemont, A; Worth, F; DU PAGE: Glen Ellyn, G; Milton Twp., G; LAKE: Grayslake, 5 A; WILL: 6 mi. South of Naperville F; Romeo, A.

THIRTEEN-STRIPED GROUND-SQUIRREL

Citellus tridecemlineatus tridecemlineatus (Mitchill)

Sciurus tridecem-lineatus Mitchill, 1821, Med. Repos., N. S., vol. 6 (21) p. 248.

Citellus tridecemlineatus tridecemlineatus Miller, 1924, List of North Amer. Recent Mammals, 1923, U. S. Nat. Mus., Bull. 128, p. 193.

Range: From southern Illinois and northern Missouri to northwestern Ohio southern Michigan and central Wisconsin, extending west and northwest to edge of the Great Plains and the Saskatchewan Region; replaced in western Missouri by an allied form, *C. t. badius*. **Type Locality:** Central Minnesota.

General description: Of typical ground-squirrel appearance, having alternating light and dark brown stripes on its back, each of the brown stripes containing a row of white spots. Underparts light brown.

Measurements: Male: Length 261-292, Tail 67-97, Hind foot 36-41. Female: Length 283-287, Tail 97-112, Hind foot 37-40.

Habitat: It is a prairie animal, preferring dry fields and tall grass to the woods or damp places. It lives in a hole in the ground.

Habits: Diurnal in habit. It does not wander extensively the way the

Franklin Ground-Squirrel does. It has a habit of sitting up straight to look about and may frequently be mistaken for a peg or a post in the ground. When alarmed, it will scuttle rapidly for its burrow. It hibernates in winter.

Food: Grain, seeds and insects.

Young: One litter, usually numbering six or seven, sometimes not more than five, and occasionally as many as ten.

Local distribution: Plentiful throughout the area.

Records.

ILLINOIS. COOK: Chicago 30 F, A; Forest View, A; Lemont, 4 A; River Forest, 2 A; Worth, F; DU PAGE: Bloomingdale Twp., G; Glen Ellyn, G; KANE: Bowes, A; LAKE: Beach F, 7 A; Fox Lake, 7 F; Grayslake F, A; WILL: Romeo, A.
INDIANA. PORTER: Hebron, N. M.



GRAY CHIPMUNK

Tamias striatus griseus Mearns

Tamias striatus griseus Mearns, 1891, Bull. Amer. Mus. Nat. Hist. Vol. 3, p. 231.

Range: Upper Mississippi Valley region, from southeastern Missouri and southern Illinois north to southern Manitoba (Shoal Lake); east to Lake Michigan and eastern Indiana and in Canada through central Ontario and Quebec to Matamek River and the Gaspé Peninsula, Gulf of St. Lawrence; west to Turtle Mountains, N. Dak. and Onaga, Kans.; north in Canada to James Bay, Ontario, and Mattagami Lake, Quebec. *Type Locality:* Fort Snelling, Hennepin County, Minnesota.

General description: A small, reddish-brown ground-squirrel, with a black stripe down the middle of the back, bordered on either side by a stripe colored like the rest of the body. These latter stripes are bordered in turn by black, whitish and black stripes in sequence. It also has stripes above and below the eyes. Its markings are very bright and distinctive. Its tail is long, flat and hairy. It is larger and grayer than the Southeastern Chipmunk and its markings not quite so bright. It is too well known to need any detailed description.

It has well-developed cheek pouches in which it can store considerable food.

Measurements: Length 243-299, Tail 92-110, Hind foot 33-38.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{1-1}$ M. $\frac{3-3}{3-3} = 20$

Habitat: Chipmunks are essentially woods animals, living in holes in the ground.

Halits: They are interesting, bright, inquisitive little creatures, constantly on the go, frequently sitting up to study the situation, scurrying here and there, approaching as close as they dare to attractive locations, where food might be found,—somewhat timorous of their reception at human hands, yet with considerable boldness. They may be coaxed to come, with repeated flicks of the tail, quite close, to obtain food which they will stuff into their cheek pouches before scampering off to a safe distance for more deliberate mastication. They do a certain amount of climbing, and in the winter time hibernate, although Howell (1929, p. 5) says their hibernation is interrupted and incomplete. In the summer months they are quite busy storing up food for future use. I remember one occasion in northern Michigan, on the 14th of October, 1932, when one of the striped chipmunks (probably Lyster's Chipmunk) ran up a sloping tree to a vertical branch and straight up this big branch to a small branch which extended horizontally about five feet above the ground. There it lay close to the main branch, head pointed out from the tree, tail hanging down. I talked to it as I reached up very slowly, touching it, and then gently pulling its tail. Down it scampered, head first, and over to a nearby log, to turn and look. While I was reaching for it, I could see its heart beating fast, ears and head shift a little, eye bright and alert, but apprehensive.

Food: Mostly grain, seeds, nuts, berries, etc., although to some extent it feeds on insects.

Young: Probably no more than one litter a year, each litter being of four or five young, born in the early spring.

Local distribution: Quite common throughout the area.

Records.

ILLINOIS. COOK: Evanston, 2 A; River Forest, 3 A; DU PAGE: Milton Twp., G; LAKE: Fox Lake, 33 F; Highland Park, 5 A, 2 M; Pistakee Bay, F.
INDIANA. PORTER: Hebron, N. M.



SOUTHERN RED SQUIRREL

Sciurus hudsonicus loquax Bangs

Sciurus hudsonicus loquax Bangs, 1896, Proc. Biol. Soc. Washington, vol. 10, p. 161.

Range: Alleghenian and Carolinian Faunae of the Humid Province. **Type Locality:** Liberty Hill, New London County, Connecticut.

General description: The smallest of our arboreal squirrels. It is reddish brown on the upper parts and white underneath. In the summer time there is a black line dividing the brown from the white. This line disappears in the winter and the squirrel's back carries a wide stripe which is much redder than the summer coat. My own observations in northern Michigan indicate that as late as the 9th of November most of the Red Squirrels still retained the distinct black line, although on some it appeared to be changing.

Measurements: Length 318, Tail 130, Hind foot 48.

Dentition of Species: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{1-1}$ M. $\frac{3-3}{3-3} = 20$

Habitat: It spends its time in the woods, living in hollow trees, logs or stumps, where it makes its nest.

Habits: Probably the liveliest, most energetic of our squirrels, and is constantly prying into other peoples' affairs, and very free to give advice with its continuous scolding. It causes considerable damage to birds by stealing eggs and young. In the pine woods, its middens, consisting of the remains of cones from which the seeds have been extracted, may be seen at frequent intervals. It accumulates an abundant supply of food for winter use as it does not hibernate. Although it is much smaller than the Gray Squirrel, it is said to be amply able to take care of itself with this larger species.

On October 19, 1932, in northern Michigan, I came on a little Red Squirrel sitting on a stump. It ate a tidbit sitting straight, tail up over its back, eyeing me as I walked to within ten feet of it, talking to it. "Another, a little farther on, ran on to a branch above our heads and scolded us roundly, flicking his tail, stamping his hind feet."

Food: Nuts, seeds, berries, birds' eggs, young birds and in fact almost anything at all edible.

Young: One litter of four to six, born in April.

Local distribution: Cory examined one specimen from Lake Forest in Lake County, Illinois (1912, p. 126), and one from Fox Lake in Lake County. Hahn wrote of it in 1908 as abundant in Porter County, Indiana, (1909, p. 409) and Lyon referred to it as fairly common in the wooded portions of the Dunes where he collected four. (1923, p. 219.)

Records.

INDIANA. LAKE: Miller, A; PORTER: 4 N.M.

NORTHERN GRAY SQUIRREL

Sciurus carolinensis leucotis Gapper

Sciurus leucotis Gapper, 1830, Zool. Journ., vol. 5, p. 206.

Sciurus carolinensis leucotis True, 1885, Proc. U. S. Nat. Mus., vol. 7 (1884), p. 595.

Range: Transition zone and locally lower edge of Canadian zone from the Alleghenies of Pennsylvania north through New York and New England, to southern New Brunswick and southern Ontario; west to Minnesota. **Type Locality:** Region between York and Lake Simcoe, Ontario, Canada.

General description: One of the larger of our arboreal squirrels; general appearance gray, with a certain amount of rusty color, brown feet, frequently whitish fur on the back of the ears, white under parts and white hairs on the outer margin of its long, bushy tail.

Measurements: Length 390-505, Tail 145-230, Hind foot 60-69.

Dentition of Species: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{2-2}{1-1}$ M. $\frac{3-3}{3-3}$ = 22

Habitat: Gray Squirrels live in the woods. They build their nests both in hollow trees and among the branches of trees. Nests in branches are made of twigs, leaves and bark. Gray Squirrels are very adaptable to civilization and frequently may be seen running about city streets in residence sections. In the public parks of large cities they seem quite at home and it is not very difficult to persuade them to eat out of the hand.

Habits: These squirrels are busy at all hours of the day, although more so in the early morning and late afternoon, traveling lightly through the tree-tops and on the ground in search of food. They are inveterate horders and while I have seen them a great many times spend many minutes eating what they have found, the occasions are as numerous when they have taken part of their treasure and buried it in a little shallow hole in the ground. I think they never bury more than one nut in the same hole, with the result that they dig an infinite number of these holes. They do not hibernate, although they are not as active in cold and stormy weather as they are on bright, warm days. Their tracks may be seen on the snow almost any time during the year. I have seen them often, foraging on the snow when it was quite cold. Of course, they do not move around as much in winter as they do in summer. When I first moved to Northfield Township, Illinois, there were no Gray Squirrels to be seen in our woods, only Fox Squirrels. Now, eight years later, the Gray probably outnumber the Fox, though both still occur on our property. The Gray do not seem to me as shy as the Fox, although they are sufficiently skittish to jump for the trunk of a nearby tree or scamper into the woods at the first appearance of human beings. I speak, of course, of those about my home, removed some five miles from any village of notable proportions.

Once I photographed one sitting at the foot of a poplar tree eating a nut. I tripped the shutter by means of an electric connection in the house that discharged a charge of flash powder. The flash made a great boom and in what appeared to me to be one leap, the squirrel had reached the side of the tree away from the camera.

On another occasion a large Gray Squirrel sat on a bird-feeding platform attached to a tree, with its tail hanging down over the edge near the trunk of

the tree. Its back was to the tree. A smaller Gray sneaked up, unobtrusively, made a brief reconnaissance, approached within range and suddenly reached up with one front foot, gave the big squirrel's tail a good jerk, and rushed on up to the safety of the higher branches, pursued for a short distance by the interrupted diner.

Evidence of the agility of these squirrels was furnished by one active individual. We had a feeding platform for birds on top of a square post and to keep the squirrels off found it necessary to suspend an apron of thin copper sheeting hanging down from the edge of the platform to a depth of six inches. This kept off most of the squirrels, but one of them was able to negotiate it by climbing up the post, leaning far out, jumping out and around the apron, clutching the edge of the tray with his forefeet and thus scrambling to the top.

Food: Mostly nuts and acorns; also seeds and buds. During the summer of 1935 Gray Squirrels ate much of our sweet-corn. Sometimes they pulled the ears from the stalks and at other times clung to the stalks and stripped the ears of their kernels, leaving the stripped ears standing stark.

Young: Four to six to a litter. There are frequently two litters, one in March or April and the other about September.

Local distribution: The Gray Squirrel occurs throughout the area.

Records.

ILLINOIS. COOK: Chicago 4 A; Glencoe, A; Palos Park, 2 A; Du PAGE: Glenn Ellyn, A; LAKE: Deerfield, A; Highland Park, 2 A, 2 F; Lake Forest A, 5 F.
INDIANA. PORTER: Hebron 2 N. M.; Jerusalem, A.

WESTERN FOX SQUIRREL

Sciurus niger rufiventer Geoffroy

Sciurus rufiventer Geoffroy, 1803, Catal. Mamm. Mus. Hist. Nat., Paris, p. 176.
Sciurus niger rufiventer Osgood, 1907, Proc. Biol. Soc. Washington, vol. 20, p. 44.

Range: Greater part of the Mississippi Valley, from northern Louisiana to southern Wisconsin. *Type Locality:* Mississippi Valley, exact locality not known.

General description: A larger species of tree squirrel than the Gray. Upper parts grayish-brown, under parts reddish-brown. There is great variation in the color scheme of the different individuals of this species.

Measurements: Length 533.5, Tail 248.2, Hind foot 73.

Dentition of Species: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{1-1}$ M. $\frac{3-3}{3-3} = 20$

Habitat: A creature of the open woods. It lives in hollow trees or nests built of sticks and leaves.

Habits: Much more solitary in its comings and goings than the Gray Squirrel. I have seen it active in fair weather during the winter, scampering over the snow on bright, cold days.

Food: Mostly nuts and acorns; also seeds and buds.

Young: One litter of two to four.

Local distribution: It is found throughout the Chicago Area.

Records.

ILLINOIS. COOK: Berwyn, A; Chicago, F; Chicago Heights, F; Palos Park, A; Du PAGE: Milton Twp., G; LAKE: Antioch, A; Deerfield, 4 A; Fox Lake, 2 F; Grayslake, A; Highland Park, 2 A; Lake Forest, 2 F.
INDIANA. LAKE: Cook A; PORTER: Hebron, NM.

SMALL EASTERN FLYING SQUIRREL

Glaucomys volans volans (Linnaeus)

[Mus] volans Linnaeus, 1758, Syst. Nat., ed. 10, vol. 1, p. 63.

Glaucomys volans volans Miller, 1924, List of North Amer. Recent Mamm. 1923 U. S. Nat. Mus. Bull. 128, p. 230.

Range: Northeastern United States and extreme southern Canada, from central Minnesota, Wisconsin and Michigan, southern Ontario, northern New York (Lewis County) and southern New Hampshire south to North Carolina (Raleigh) Tennessee (Nashville) and northern Arkansas and Oklahoma (Boston Mountains); west to eastern Nebraska (Otoe and Nemaha Counties) and Eastern Kansas (Douglas and Woodson Counties). **Type Locality:** Virginia.

General description: Most strictly arboreal of all our squirrels. Small in size, covered with a very soft fur, grayish brown on the upper parts, white on the under parts. It has very large eyes and a broad, flat tail. Its wrists and ankles are connected by membrane, enabling it to glide through the air from tree to tree, from higher to lower elevation. This, of course, is not a real flight, but it is the basis of its name "Flying Squirrel".

Measurements: Length, 220-240, Tail 90-110, Hind foot 29-32.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{2-2}{1-1}$ M. $\frac{3-3}{3-3} = 22$

Habitat: It is a woods dweller, living in hollows in trees and frequently occupying former woodpecker nesting sites.

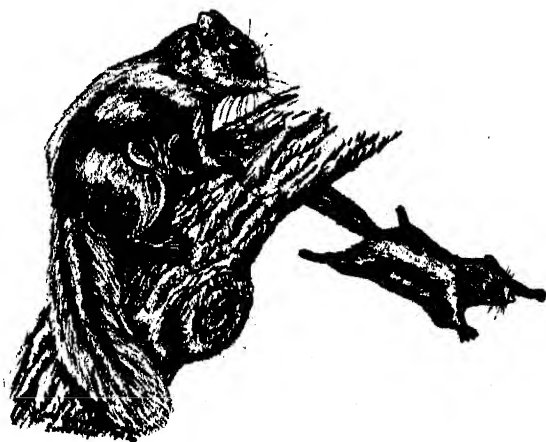
Habits: Unlike the other arboreal squirrels, the Flying Squirrel is nocturnal in habit and is very seldom seen before dark, unless disturbed. If the tree in which it is reposing is struck a few resounding blows, the squirrel will almost invariably peer out of its hole, then dart out and glide to some other tree at a safe distance. While there seems to be some doubt as to whether or not these squirrels hibernate, it is generally believed that they do not. This does not mean that they do not remain in their snug nests in very severe weather. They are much more gregarious than the other tree squirrels.

Food: Mostly nuts, but to some extent insects and meat.

Young: One or two litters of some three to six each.

Local distribution: Throughout the Chicago Area.

Records, ILLINOIS. COOK: Evanston, 2 A; Willow Springs, F; DU PAGE: Bloomingdale, G; Glen Ellyn, G; KANE: St. Charles, 2 A; LAKE: Deerfield, A, F; Haliday, 3 A, 2 M; Highland Park, F; Lake Forest, F; Waukegan, 3 A.



ILLINOIS POCKET GOPHER

Geomys bursarius illinoensis Komarek and Spencer

Geomys bursarius illinoensis Komarek & Spencer, 1931, Journ. Mamm., vol. 12, p. 405.

Range: Brown, sandy loam areas of central Illinois and northwestern Indiana, within the region bounded by the Mississippi, Illinois, Kankakee and Wabash Rivers. **Type Locality:** One mile south of Momence, Kankakee County, Illinois.

General description: A short-legged, heavy-set rodent somewhat larger than the Norway Rat, but much heavier. It is slate-gray in color and the terminal portion of the rat-like tail very nearly bare. The claws on its front feet are very strong and well developed for digging. The animal derives its popular name from the fur-lined pockets or pouches in its cheeks opening on the outside.

Measurements: Males: Length 265-322, Tail 88-98, Hind foot, 32-36. Females: Length 253-273, Tail 69-73, Hind foot 32-35.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{1-1}$ M. $\frac{3-3}{3-3} = 20$

Habitat: Open prairies, especially in sandy soil where it may readily dig its burrows and underground tunnels.

Habits: The true gopher spends practically all of its time underground. It digs elaborate burrows with extensive and intricate systems of galleries and when it is digging into the ground to make its home, it will invariably cover the entrance with a mound of earth. It is constantly storing up food carried in its cheek pouches and will generally have more of a supply than it needs. It does not hibernate.

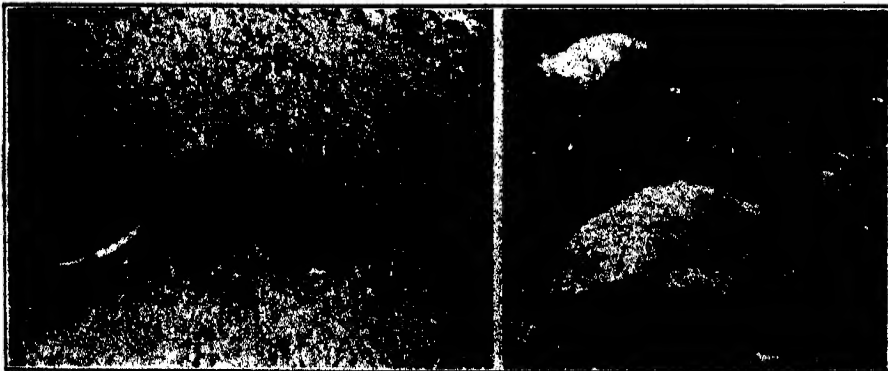
Food: Its food consists for the most part of roots of all sorts of plants and to some extent roots of trees and garden vegetables and crops. The roots, of course, which it feeds on are thus obtained underground, but Anthony says that it occasionally sticks its head out of its burrow to nibble at clover.

Young: Three to eight, generally born in April.

Local distribution: It appears to occur now only in the southern part of our area. There are some actual specimens from Will County, Illinois. Knowledge of the distribution in the area is limited to the record of specimens taken.

Records.

ILLINOIS. WILL: Custer Park, 4 A.



CANADIAN BEAVER

Castor canadensis canadensis Kuhl

Castor canadensis Kuhl, 1820, Beiträge z. Zoologie, p. 64.

Castor canadensis canadensis, Miller, 1924, List of North Amer. Recent Mamm. 1923 U. S. Nat. Mus. Bull. 128, p. 298.

Range: Northern North America from nearly 70° north in Yukon and 58° in Labrador, south to about 35 in eastern and central states, and 45 in the Rocky Mountain section (Anthony, 1928, p. 329). **Type Locality:** Hudson Bay.

General description: A large, sturdy, strongly built rodent—in fact the largest of our rodents—with webbed hind feet, broad, flat, hairless tail, and powerful chiseling incisors. It is covered with dark brown fur, the under hair being very soft and thick, and the guard hairs long and coarse. The nail of the second toe in its hind foot is cleft or double, and apparently is used as a comb.

Measurements: Length 1068, Tail 410, Hind foot 175.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{1-1}$ M. $\frac{3-3}{3-3} = 20$

Habitat: Beavers inhabit lakes and streams in wooded areas. They sometimes live in burrows in the banks, but generally construct houses of sticks and brush in their ponds.

Habits: I think beavers have been credited with more intelligence than they actually possess. There is no doubt that they are industrious workers. When a pair of beavers determine that they will make their abode in a stream, their first task is to construct a dam of sticks and stones and mud and sometimes sizable logs across the stream, causing the water to rise and make for them a pond in which their home may be built. Sometimes they build their houses in inland lakes and ponds where it is not necessary to make a dam. The house has a single room, the floor of which is above the surface of the water. Generally there are two entrances to the house, both, of course, entering its walls under water. When all the log work has been done and the weather begins to turn cold, beavers habitually carry mud onto that portion of the house standing above the water. They use their forefeet and forearms in this work. When the house is thoroughly plastered with mud, and the mud freezes, a certain amount of protection is afforded against the beavers' natural enemies.

Another serious enterprise in the fall is the cutting and storing of an adequate supply of food to last over the winter. Saplings and brushy tops are cut and carried to the water's edge and there floated by the beavers, guided in their strong teeth to a point close to the house. I am not certain just how they make some of the wood of their brush pile stay on the bottom of the pond. Probably they carry it down and imbed it in the mud. In any event, before long they have built a great heap which shows above the surface. When the water of their pond or lake freezes, they thus have access all winter from their house to this fine supply of food, without the necessity of appearing above the ice. Their instinct to cut and store for this purpose is so strong that I have known occasions where they apparently continued their operations long after having accumulated much more than their requirements. I have occa-

sionally seen trees cut by beavers in March when the ground was covered with several feet of snow.

Their broad, flat tails are used to help steady them when they stand upright in cutting timber and when they are carrying mud onto their houses. They are also in constant use in slapping the water with a resounding whack before the beavers dive. This is a common danger signal, recognized not only by members of their own kind, but also by other wild animals. I have seen a deer take alarm at the sound when there was nothing else to disturb it.

Beavers are great swimmers, using their hind feet exclusively to propel them, either on the surface or under water. They can move with great speed under the surface. On dry land they are slow and clumsy. They have a valve in each ear which closes when they go under-water, and opens up again as their head breaks the surface.

It has been my experience that their eyesight is not very good. They apparently rely much more on their sense of smell to advise them of the presence of strangers and potential enemies, or members of their own clan. I have watched them swimming close to the bow of my canoe while I sat with the stern anchored on a sand bar, unable to satisfy themselves as to the nature of the intruder because no air stirred to give me away. They would dive and reappear repeatedly, tossing their noses in the air over and over again, apparently sniffing for tell-tale sign.

Again I watched a number of beavers close to their house in the dim light of early morning. The air was still and the animals appeared to experience the same difficulty in recognizing me, although I sat in my boat hardly ten feet away. One very young beaver was inclined to minimize the importance of being still when the older ones, because of motion on my part, thought it wise to "freeze". They obtained what looked like some measure of obedience by swimming close to the little one. I could not hear them communicate any commands. These periods of inactivity were short. It took but a moment of stillness on my part to reassure them and they went on with their feeding, moving in their canals, diving silently to enter their house, talking together inside in audible tones with that characteristic squeaky whine. A large member of the colony came noisily down a slide from top to bottom of a steep bank, dragging a log. He took it into the water with him and swam out towards the house, towing it. My conduct disturbed him and he let go his burden and dived without a sound once or twice after a short swim of reconnaissance, and finally disappeared.

There is a sort of legend that beavers in cutting down trees can fell them in any direction desired. If this be true, they are most wasteful. I have seen many trees cut by beavers which, in falling, were caught and hung in the branches of other trees so that they never reached the ground and were abandoned. An even more convincing argument against the existence of this ability in the beavers, was furnished to me in a photograph obtained with the set-camera. The trip wire was led to the top of a poplar sapling stuck in the ground as beaver bait. The sapling was felled by one beaver and the flash discharged just as the falling tree struck the shoulders of another beaver. I

found no beaver remains when picking up the negative the morning after the flash, and therefore I assume that no serious damage was done.

I know of one incident bearing on the question of whether or not an old beaver will tolerate in the home other than her own offspring. A female and one of her young were captured alive and held in captivity in a log room especially constructed with access to water. A day or two later a young one from another litter was added to the group. The old beaver killed it with her teeth, filling its hide as full of holes as if it had been fired on with a charge of buckshot.

Food: The favorite food of beavers is the bark of quaking aspen or poplar. Of course, this is not always obtainable and beavers will also apparently relish the bark of willow, birch and other trees and bushes, and sometimes eat leaves and twigs. They will on occasion eat the bark of hardwoods and even of the conifers. In captivity they seem to relish bread.

Young: Two to eight born usually in May; average number in litter, four.

Local distribution: The beaver no longer exists in the area.

Records.

INDIANA. LAKE: 3 N. Y.; PORTER: Ogden Dunes, F.

BAIRD WHITE-FOOTED MOUSE

Peromyscus maniculatus bairdii (Hoy & Kennicott)

Mus bairdii Hoy and Kennicott, 1857, in Kennicott Agricultural Report, U. S. Patent Office, 1856, p. 92.
Peromyscus maniculatus bairdii, Osgood, 1909, N. Amer. Fauna, no. 28, p. 79.

Range: Prairie region of the upper Mississippi Valley in southern Wisconsin, Minnesota, Illinois, Indiana, eastern Ohio, Iowa, Missouri, Oklahoma, and the eastern or humid parts of Kansas, Nebraska, South Dakota, and North Dakota; north to southern Manitoba, Upper Austral and Transition zones, meeting the range of *P. m. nebrascensis* along the border between the humid and the arid subdivision. *Type Locality:* Bloomington, McLean County, Illinois.

General description: Brown above, the upper parts darker in the middle of the back, under parts white; large ears and big, shoe-button eyes.

Measurements: Length 124-161, Tail 46-70, Hind foot 16-19.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{0-0}{0-0}$ M. $\frac{3-3}{3-3} = 16$

Habitat: Dry fields and meadows and to some extent very open woods.

Habits: These mice generally live in burrows, although they sometimes build nests in corn shocks or other shelter above the ground. They are active in winter as well as summer. They are largely nocturnal in habit. Not infrequently they damage fruit trees by making their homes at the roots and gnawing the bark.

Food: Plants and seeds. Rolled oats constitute good bait and peanut butter is always relished. I attached bait once to the side of a smooth dead tree, several feet above the ground, in an effort to photograph the Flying Squirrel. The bait was porkrind. It was constantly taken by a mouse of a more northerly race of this same species. We know this as it left us its picture. On

another occasion this same form of mouse worried our bait, consisting of a dead member of its kind, sufficiently to trip the flash and leave us a picture. Whether our subject was foraging or not, of course, I cannot say.

Young: From three to six, generally five. There may be several litters, born almost any season of the year.

Local distribution: Common throughout the area.

Records.

ILLINOIS. COOK: Chicago, 12 F; Forest View, 3 A; Lemont, 2 A; River Forest, 5 A; DU PAGE: Bloomingdale Twp. G; LAKE: Beach, 5 A, F; Deerfield, M; Fox Lake, 19 F; Waukegan, 3 A.



NORTHERN WHITE-FOOTED MOUSE

Peromyscus leucopus noveboracensis (Fischer)

[*Mus sylvaticus*] *noveboracensis* Fischer, 1829, Synopsis Mammalium, p. 318.

Peromyscus leucopus noveboracensis Miller, 1897, Proc. Boston Soc. Nat. Hist., vol. 28, p. 22.

Range: Upper Austral and Transition zones of the eastern United States and Canada. Extending from Nova Scotia to central Minnesota, thence south through the humid parts of eastern Nebraska and Kansas and eastward to the Atlantic coast, following quite closely the boundary between the Lower and Upper Austral zones on the south and that between the Transition and Canadian on the north. *Type Locality:* New York.

General description: Quite similar to the Baird White-footed Mouse, but larger, with a longer tail and not quite so dark in color.

Measurements: Male: Length 161-182, Tail 75-85, Hind foot 20-21. Female: Length 115-185, Tail 71-89, Hind foot 19-22.

Habitat: It lives in the woods as a rule, and builds its nests in hollow logs or under logs, under brush piles and sometimes in bushes in old bird's nests.

Whenever the nest is in the ground, it is connected with the surface by short tunnels.

Habits: It does not hibernate and is active throughout the year. It stores considerable food for winter use. When I was obtaining a series of flashlight pictures of these mice, my camera was contained in a metal housing. On the morning I picked it up I found the space between the back of the camera and the back of the housing filled with leaves and the mouse reposing therein. When I touched him he ran out past the front of the camera, down the tripod legs, up a grapevine into the brush, and eventually onto the ground and away.

Food: Seeds, nuts, grain and dried vegetation. I have known one of these mice to lift a large walnut in its mouth. It will gnaw through a nut-shell and eat the meat.

Young: Three to seven per litter and three or four litters a year.

Local distribution: Common throughout the area in all its wooded sections.

Records.

ILLINOIS. COOK: Elk Grove, 2 A; Glencoe, A; Lemont, 3 A; Maywood, A; Palos Park, A; DE KALB: Somonauk, 2 A; DU PAGE: Glen Ellyn, G; Naperville, A; KANE: Bowes, 2 A; LAKE: Beach, 11 A; Camp Logan, 11 F; Deerfield, 6 A, F; Fox Lake, 19 F; Highland Park, 2 F, M, 12 A; Prairie View, 3 A; WILL: New Lenox, A.
INDIANA. LAKE: St. John, A; PORTER: Hebron, 2 N. M.; Mineral Springs, 5 A.

STONE LEMMING MOUSE

Synaptomys cooperi stonei Rhoads

Synaptomys stonei Rhoads, 1893, Amer. Nat., Vol. 27, p. 33.

Synaptomys cooperi stonei Rhoads, 1897, Proc. Acad. Nat. Sci., Philadelphia, 1897, p. 305.

Range: Lower portion of Transition and northern half of the Upper Austral Zones in the United States east of the Plains from central Wisconsin and Illinois east to the Atlantic coast; occurs as far north as Massachusetts and south in the mountains into North Carolina. **Type Locality:** Mays Landing (on Egg River), Atlantic County, New Jersey.

General description: Resembles the Meadow Mouse in appearance. It is dark brown above and dark gray below. It has a large head and very short tail. Its eyes and ears are small.

Measurements: Length, 127, Tail 21, Hind foot 20.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{0-0}{0-0}$ M. $\frac{3-3}{3-3} = 16$

The upper incisors are grooved on the front surface longitudinally.

Habitat: The Lemming Mouse lives generally in bogs and marshy and swampy places.

Habits: It builds its nest of grass and lives in a burrow in the ground. Its runways extend from this burrow under the vegetation. It stores a great deal of food for winter use and does not hibernate.

Food: Mostly grasses.

Young: Several litters of four to six each.

Local distribution: These mice occur sparsely in swampy ground throughout the area, though there are very few records available.

Records.

INDIANA. PORTER: 2 N. M.

EASTERN MEADOW MOUSE

Microtus pennsylvanicus pennsylvanicus (Ord)

Mus pennsylvanicus Ord, 1815, Guthrie's Geography, 2d Amer. ed., vol. 2, p. 292.
Microtus pennsylvanicus pennsylvanicus, Miller, 1924, List of North Amer. Recent Mammals, 1923, U. S. Nat. Mus. Bull. 128, p. 405.

Range: Eastern United States and westward as far as Dakota and Nebraska, shading into *M. modestus* of the western plains and Rocky Mountains. In a general way it occupies the Transition Zone from the Atlantic coast to the edge of the Great Plains. **Type Locality:** Meadows below Philadelphia, Pennsylvania.

General description: A stockily built vole. Dark brown in color, dark gray underparts, small eyes and ears and a short tail. This form is distinguishable from the other species, *M. ochrogaster*, by the posterior fifth loop in the enamel pattern of the second upper molar.

Measurements: Male: Length 130-163, Tail 32-48, Hind foot, 19-23. Female: Length 130-177, Tail 35-54, Hind foot 18-21.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{0-0}{0-0}$ M. $\frac{3-3}{3-3} = 16$

Habitat: As their name suggests, these mice live in the open fields and meadows. They build their nests in burrows in the ground and travel on their network of runways—well beaten paths under the grass.

Habits: They are active throughout the year, traveling under the snow in winter, and are more likely to be abroad during daylight hours than most mice. They sometimes indulge in a limited migration in considerable numbers.

I found them more difficult to photograph than the White-footed Mouse because of their quick reactions and jerky movements and their general aggressive attitude towards my bait. Their favorite bait was melon rind. This they would frequently strike with their forepaws, especially if it consisted of a large piece, before starting to eat it or carrying it down into the burrow for consumption. The inhabitant of one burrow in particular became so accustomed to my presence that immediately after I had walked across the ground on top of the burrow he would stick his nose out looking for food. It was necessary for me to scold him and send him scurrying back out of sight until I could set out the bait and wire it in such a way that when it was taken the flash would be discharged. After a week or so of this method of operation, the mouse became so tame that I could stand and watch him and trip my shutter by hand.



The camera was less than two feet from the burrow and I stood with the camera. On one occasion I tried to tempt this mouse into taking a piece of rind from my fingers, holding it at the entrance to his den. He came out into view, but remained in the entrance way, several inches from my fingers and my patience was finally stretched to the breaking point by a mosquito onslaught.

Food: Principally grasses and grass roots, seeds, grain and bark.

Young: Four to eight in a litter. These mice breed practically the year round.

Local distribution: Common throughout the area.

Records.

ILLINOIS. COOK: Argo, F; Chicago, 10 F; Elk Grove, 3 A; Elmwood Park, A; Glen-coe, A; Lambert, A; Lemont, 2 A; Mount Claire, 3 A; Niles Center, 4 A; Oak Park, 7 A; Palcs Park, A; River Forest, 2 A; West Northfield, 2 A; DE KALB: Somonauk, A; DU PAGE: Glen Ellyn, G; LAKE: Beach, 11 A; Camp Logan 4 F; Deerfield, 2 A; Fox Lake, 31, F; Highland Park, 12 A, M; Pistakee Bay, 9 F; Prairie View, 3 A; WILL: New Lenox, A.

INDIANA. PORTER: Dune State Park, 2 F; Dune Acres, 2 A.

PRAIRIE MEADOW MOUSE

Microtus ochrogaster (Wagner)

Hypudaeus ochrogaster, Wagner, 1842, Schreiber's Säugethiere, Suppl., vol. 3, p. 592.
Microtus ochrogaster, Osgeod, 1907, Proc. Biol. Soc. Washington, vol. 20, p. 48.

Range: Central part of Mississippi Valley from southern Wisconsin to southern Missouri and Fort Reno, Oklahoma, and west into eastern Nebraska and Kansas. *Type Locality*: America.

General description: This species has a slightly shorter tail and coarser pelage than *pennsylvanicus*, the upper parts having a more grizzled appearance. The underparts are gray with brownish tinge. The second upper molar has only four enamel loops.

Measurements: Length 152, Tail 35, Hind foot 20.

Habitat: Dry prairies.

Habits: Similar to those of *pennsylvanicus*.

Food: Principally grasses and grass roots, seeds, grain and bark.

Young: Several litters a year of four to six each.

Local distribution: Occurs throughout the area,—more common in south.

Records.

ILLINOIS. COOK: Lemont, A; DU PAGE: Glen Ellyn, G; LAKE: Beach, F; Fox Lake, 8 F; Gilmer, M.

MOLE PINE MOUSE

Pitymys pinetorum scalopsoides (Audubon & Bachman)

Arvicola scalopsoides, Audubon & Bachman, 1841, Proc. Acad. Nat. Sci. Philadelphia, vol. 1, p. 97.
Pitymys pinetorum scalopsoides Miller, 1912, N. Amer. Land Mamm. 1911, p. 229.

Range: Southern New York and westward to Illinois, southward along the coast, blending into true *pinetorum*. *Type Locality*: Long Island, New York.

General description: It is dark brown above and dark gray underneath, with small ears and a short tail and may be distinguished from the meadow mice by the shortness and fineness of its fur.

Measurements: Male: Length 113-125, Tail 19-20, Hind foot 17-18. Female: Length 110-122, Tail 18-20, Hind foot 17.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{0-0}{0-0}$ M. $\frac{3-3}{3-3} = 16$

Habitat: It inhabits grassy meadows, but is also found in bushy patches of woods, although it is not a dweller of dense forests. It lives for the most part underground, traveling in underground tunnels rather than in tunnels such as are used by meadow mice. It does, however, maintain frequent openings to the surface of the ground from its tunnels.

Habits: The Pine Mouse spends most of its time in its underground tunnels. It is active not only in summer but also in winter when it does considerable damage to fruit trees.

Young: Several litters a year, numbering from one to four each.

Food: Principally roots and bulbs; also vegetables and the bark of fruit trees.

Local distributions: It has been taken in Cook, Lake, Will and DuPage counties, Illinois, and M. W. Lyon, Jr. reports two specimens from Porter County, Indiana. (Lyon, 1922-23, p. 218).

Records.

ILLINOIS. COOK: Palos Park, 2 A; DU PAGE: Downers Grove, F; LAKE: Highland Park, 2 F; WIL: New Lenox, A.

COMMON MUSKRAT

Ondatra zibethica zibethica (Linnaeus)

[Castor]zibethicus Linnaeus, 1766, Syst. Nat., ed. 12, vol. 1, p. 79.
Ondatra zibethica zibethica, Miller, 1912, North Amer. Land Mamm. 1911, p. 230.

Range: Southeastern Canada, northeastern and east central United States; from New Brunswick and Quebec west to Minnesota and south to northern Georgia and Arkansas, except along the Atlantic seaboard south of Delaware Bay. **Type Locality:** Eastern Canada.

General description: A large, stockily built rat, with short legs and long, scaly tail, covered very sparsely with hair. The tail is flat vertically, the hind feet are partially webbed. The general color dark brown above, dirty white or brownish white underneath. This animal has a very thick, soft, waterproof under fur, covered with long, dark hairs.

Measurements: Length, 563, Tail 254, Hind foot 81.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{0-0}{0-0}$ M. $\frac{3-3}{3-3} = 16$

Habitat: Muskrats are semi-aquatic and always live near the water, making their homes either in burrows in the banks of streams and canals or in houses which they build themselves out of reeds and sticks and mud, where they can be quite comfortable in winter. They are found frequently in small ponds and swampy lands.

Habits: They are more active at night than in the daytime though they may frequently be seen during the hours of daylight. They do not hibernate. They spend most of their time in the water and are, of course, expert swimmers, traveling under water with the greatest of ease. They may sometimes be followed in their course when thus navigating by the line of air bubbles breaking the surface.

On one occasion I watched two in the light of my jack as they swam towards each other on the surface. Neither changed its course. When they came together there was a short tussle. They seemed to rise up as they came to grips, then quickly parted and went their separate ways. Another time I watched a small muskrat swimming lazily about, resting on the surface of the water, presumably on some submerged branch near a beavers winter food pile, chewing on a morsel of food with apparent satisfaction. Directly a mink swam out from shore and moved about within a few feet of where the muskrat rested. The latter immediately "froze," remaining perfectly still until the mink had moved off without noticing this tasty specimen of his natural prey.

Once we camped near the banks of a trout stream where others had been before us during a week when the weather was cold and rainy. Here we found a muskrat one morning near our provision tent, fully one hundred feet from the water. It did not appear to be the least bit frightened and enjoyed the bacon rind we gave it. While eating, it brooked no interference and showed every disposition to fight if we threatened to disturb it. After the meal was finished however it appeared to enjoy thoroughly a gentle rubbing with a stick and closed its eyes as though ready to take a nap.

Food: Mainly roots and bulbs of aquatic plants but also fresh water mussels and occasionally fruit and vegetables.

Young: Three to five litters a year of three to twelve individuals each.

Local distribution: They may be found in the open marshes and the waterways throughout the area.

Records.

ILLINOIS. COOK: Chicago, 6 F; Lemont, A; Orland Park, A; Skokie Marsh, A; Du PAGE: Milton Twp., G; LAKE: Deerfield, 3 A; Fox Lake, 7 F; Highland Park, M; Libertyville, F; Waukegan, F.

INDIANA. LAKE: Miller, G; PORTER: 2 F; Hebron, N M.



HUDSON BAY JUMPING MOUSE

Zapus hudsonius hudsonius (Zimmermann)

Dipus hudsonius, Zimmermann, 1780, Geogr. Gesch., vol. 2, p. 358.
Zapus hudsonius hudsonius, Miller, 1924, List of North American Recent Mammals, 1923, U. S. Nat. Mus. Bull. 128, p. 432.

Range: From the southern shores of Hudson Bay south to New Jersey, and in the mountains to North Carolina, west to Iowa and Missouri, and northwest to Alaska. **Type Locality:** Hudson Bay.

General description: This mouse is characterized by its very long tail, long hind legs, short front legs and long ears. Its body is not much different in size from the Common House Mouse and its upper parts are dark brown, lighter on the sides, with a touch of yellow, and the underparts and feet are white.

Measurements: Length, 216.6-218, Tail 129.25-133, Hind foot 30.2-31.25.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{0-0}$ M. $\frac{3-3}{3-3} = 18$

Habitat: It lives in moist localities and prefers brushy areas in the open or at the edge of woods. It nests in burrows in the ground or hollow trees or stumps and sometimes under logs.

Habits: The most startling single feature of the conduct of this mouse is its ability as a jumper. It is said that it is able to jump as much as ten feet in one jump and it alights and takes off again with great resiliency. In very cold weather it hibernates, but not always profoundly.

Food: Largely seeds and grain and herbaceous plants. When living in the woods it will also eat nuts.

Young: Probably two litters of five or six each.

Local distribution: It is not at all abundant in the area, but such records as there are extend from Lake County, Illinois, to Porter County, Indiana.

Records:

ILLINOIS. KANE: Sugar Grove, A; LAKE: Deerfield, M; Fox Lake, 3 F.
INDIANA. PORTER: Dune Acres, F.



CANADA PORCUPINE

Erethizon dorsatum dorsatum (Linnaeus)

[*Hystrix*] *dorsata*, Linnaeus, 1758, Syst. Nat., ed. 10, vol. 1, p. 57.
Erethizon dorsatus dorsatus, True, 1885, Proc. U. S. Nat. Mus., vol. 7 (1884), p. 600.

Range: From Nova Scotia south through Pennsylvania in the mountains, westward in forests through the Great Lakes district and northwestward to the Arctic Circle. **Type locality:** Eastern Canada.

General description: A large, squat rodent, with blunt muzzle, fairly short legs, and clumsy gait. It has soft fur and long guard-hairs, but the most notable characteristic of this mammal is the spines with which the upper parts are covered from crown to tip of tail. These spines are barbed and attached very loosely to the skin so that when the animal is touched they come away readily. The porcupine can strike quite well with the tail and when the tail is sharply flicked, some of these loosely hung quills or spines are dislodged without contact with any foreign object. But the porcupine cannot shoot its quills as has been sometimes popularly supposed. General color of the hair is very dark, sometimes dark brown and sometimes practically black, although there is considerable variation in individuals. Occasionally one is seen with a marked yellowish tinge.

Measurements: Length, about 890, Tail about 152, Hind foot about 90.

Dentition of Genus: I. $\frac{1-1}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{1-1}{1-1}$ M. $\frac{3-3}{3-3} = 20$

Habitat: The porcupine lives in the woods and makes its home in hollow logs or stumps or cavelike openings under rocks.



Habits: Porcupines are active the year round. They are great climbers and spend most of their time in the trees. They may be seen frequently in the daytime, although they prefer to move around at night. I have seen them on the shore of a lake at the water's edge under the jacklight many times and have heard them whining and grunting even when they could not be seen. They swim readily, rather high out of the water. I saw one in Montana once climb up a tree to a height of several feet from the ground, then slip, lose its hold and fall flat on its back. It did not seem to be injured. Porcupines have a habit of chattering their teeth when they are alarmed or angered. They sometimes do considerable damage to trees by completely girdling them in eating the bark. Although they appear awkward when they are wobbling along on the ground, they are quite agile in defending themselves when molested. They are inordinately fond of anything tasting of salt and will chew up oar handles, paddle handles, axe handles and any other implements, including aluminum cooking utensils which, through handling by man, have retained a trace of salt from perspiration on the hands. In the past in some states porcupines have been protected because they are about the only meat obtainable by an unarmed man lost in the woods. If the meat is properly soaked in salt water and parboiled, it is tender and quite palatable, although it does not have much flavor.

Food: Twigs, buds, leaves and especially bark of various trees.

Young: One litter a year consisting of one to four.

Local distribution: It is extremely doubtful whether or not the porcupine now actually occurs in the area. It is included because of one record of which the specimen is extant, although it is not at all certain that this specimen was not brought into the area from the North Woods and escaped from captivity.

Records:

ILLINOIS. LAKE: Barrington, 2 F. (Female and embryo).

MEARNS COTTONTAIL

Sylvilagus floridanus mearnsii (Allen)

Lepus sylvaticus mearnsii, Allen, 1894, Bull. Amer. Mus. Nat. Hist., vol. 6, p. 171.
Sylvilagus floridanus mearnsii, Lyon, 1904, Smiths. Misc. Coll., vol. 45, p. 336.

Range: West of Allegheny Mountains from Lake Simcoe, Toronto, Canada, central New York, central Pennsylvania, western West Virginia, and eastern Kentucky, and eastern Tennessee, west through southern Michigan and Wisconsin to southeastern Minnesota and south through Iowa to Trego County, Kansas, northern Missouri and Illinois, with all of Indiana and Ohio. Vertical range from about 300 feet in western New York to about 2,000 feet altitude in mountains of western Pennsylvania; zonal range mainly Upper Austral, extending into lower part of Transition Zone. *Type locality:* Fort Snelling, Hennepin County, Minnesota.

General description: The Cottontail is so well known as hardly to need description. It is a small rabbit, with long hind legs, long ears and white fur on the under side of the tail which gives it its name. Its pelage is very soft and although the colors vary to some extent in the individuals, the general impression is grayish-brown, with white underparts.

Measurements: Length 446, Tail 60, Hind foot 104, Ear 54.3.

Dentition of Genus: I. $\frac{2-2}{1-1}$ C. $\frac{0-0}{0-0}$ Pm. $\frac{3-3}{2-2}$ M. $\frac{3-3}{3-3} = 28$

Habitat: It lives in open fields or brushy woods. It may make its home in a brush pile or in a burrow in the ground. It does not actually dig its own burrow but sometimes digs itself a hole by which to get under a tool shed or other convenient cover.

Habits: These rabbits spend many daylight hours in so-called "forms",—slight depressions in the ground to fit the bodies of the rabbits. I have frequently seen them active around sundown, though I think most of their foraging is done at night. I watched two with considerable interest as they cavorted at the edge of the woods immediately back of my house. One of them repeatedly charged the other and the second one met each of these onslaughts by leaping straight into the air. They never came to grips but finally moved away. The habits of the Cottontails are really so well known that it hardly seems necessary to make any comments. They do not hibernate.

Food: Leaves, buds, grasses, vegetables and the bark of young trees.

Young: Several litters each year of from three to seven.

Local distribution: Common throughout the area.

Records:

ILLINOIS. COOK: Chicago F; Lemont, A; Orland Park, A; River Forest, A; DuPAGE: Glen Ellyn, G; LAKE: Camp Logan, F; Deerfield, M, A; Fox Lake, 4 F; Volo, 2 A.
INDIANA. PORTER: Hebron, N. M.



Mammals of Broad Range Which Have Not Yet Been Recorded

GEORGIAN BAT

Pipistrellus subflavus subflavus (F. Cuvier)

V[espertilio] subflavus F. Cuvier, 1832, *Nouv. ann. mus. hist. nat. Paris*, vol. 1, p. 17.
Pipistrellus subflavus subflavus, Miller, 1924, *List of North American Recent Mammals*, 1923, U. S. Nat. Mus. Bull. 128, p. 71.

Range: Austral zones and casually parts of Transition zone in the Eastern United States, from the Atlantic coast west to Iowa and Eastern and southern Texas. **Type Locality:** Eastern United States, probably Georgia.

General description: One of the smallest of bats, yellowish brown in color.

Measurements: Length 84-85.1, Tail 37.8-40.7, Hind Foot 7.8-8.1, Ear 13.9-14.2.

Dentition of Genus: I. $\frac{2-2}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{2-2}{2-2}$ M. $\frac{3-3}{3-3} = 34$

Habitat: Rocky country, especially caves and crannies in the rocks.

Habits: I have no information particularly applicable to this form of bat.

Food: They are insectivorous.

Young: From one to three each year.

Local distribution: Most likely to occur in the southern portion of the Area.

STAR-NOSED MOLE

Condylura cristata (Linnaeus)

(*Sorex*) *cristatus* Linnaeus, 1758, *Syst. Nat.*, ed. 10, vol. 1, p. 53.
Condylura cristata Desmarest, 1819, *Journ. de Phys.*, vol. 89, p. 230.

Range: Southeastern Canada and northeastern United States, from southern Labrador, central Quebec and Ontario, and southeastern Manitoba, south to northeastern Illinois and northern Indiana and Ohio; in the Atlantic Coast region south to Virginia (Dismal Swamp) and Georgia (Marlow); and in the Appalachian Mountains to western North Carolina. **Type Locality:** Pennsylvania.

General description: General color dark brown. This mole is characterized by a fringe of fleshy projections surrounding the edge of its muzzle, having somewhat the appearance of a star-fish, by its long, well-haired tail and dark color. It has the typical small eyes, rudimentary external ears, and large, strong forefeet for digging of all the moles. Its pelage is soft and velvety.

Measurements: Length 183-211, Tail (winter) 65-66, (summer) 71-83.5, Hind foot 26-30.

Dentition of Genus: I. $\frac{3-3}{3-3}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{4-4}{4-4}$ M. $\frac{3-3}{3-3} = 44$

Habitat: It appears to prefer damp, low ground for its characteristic tunnels.

Habits: Similar to those of the Prairie Mole. Active throughout the year.

Food: Largely insects and worms.

Young: Probably one litter of about four.

Local distribution: Supposedly throughout the area. Not at all common.

BACHMAN SHREW

Sorex longirostris longirostris Bachman

Sorex longirostris Bachman, 1837, Journ. Acad. Nat. Sci. Philadelphia vol. 7, part 2, p. 370.
Sorex longirostris longirostris, Jackson, 1928 North American Fauna No. 51, p. 85.

Range: Atlantic Plain and Piedmont region (except vicinity of Dismal Swamp, Va., inhabited by *S. l. fisheri*) from northern Virginia and southern Maryland, south to northern Florida (Alachua County) and central Alabama (Autauga County) Eastern and southern Illinois and southwestern Indiana. **Type Locality:** Hume Plantation, swamps of the Santee River (Cat Island, mouth of Santee River) S. C.

General description: A long tailed shrew, not unlike the Cinereous Shrew in general appearance. Of dull brown color with the characteristic long snout and small eyes.

Measurements: Length about 87, Tail 32, Hind foot 10.5.

Dentition of Genus: I. $\frac{3-3}{1-1}$ C. $\frac{1-1}{1-1}$ Pm. $\frac{3-3}{1-1}$ M. $\frac{3-3}{3-3} = 32$

Habitat: Generally damp ground where vegetation is thick.

Habits: So far as known, similar to those of the Cinereous Shrew. Active throughout the year.

Food: Insects, larvae and other animal matter.

Young: Probably four or five in one litter.

Local distribution: Supposedly throughout the Area.

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Program of Activities
of
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No. 4



LIST OF PUBLICATIONS OF
THE ACADEMY



THE CHICAGO ACADEMY OF SCIENCES
Lincoln Park at Center Street
CHICAGO

AUTUMN PROGRAM OF ILLUSTRATED LECTURES

The Academy announces another series of free Public Lectures during this season in the Assembly Hall, Sunday afternoons at three o'clock. The doors will be open at 2:45, and will be closed at three or before if the hall is filled. Reserved seats will be held for members until three o'clock.

November 15—A Naturalist in Panama.

Dr. Orlando Park

Dr. Park of Northwestern University will speak on this summer's work at the Barro Colorado Island Laboratory in the Panama Canal Zone, and will tell of some of his experiences in the Panamanian jungles.

Illustrated

November 22—Gardens. Tropical and Temperate.

Dr. Louis J. Tint

Dr. Tint will again be with us to show his beautiful natural color photographs, this time primarily of gardens. He will draw a comparison between the gardens of the Caribbean and those farther south with those of our own vicinity, showing that we have in the north as much, if not more, beauty and color in our plants as those in the tropics.

Illustrated

November 29—No lecture scheduled.

December 6—Cancer.

F. L. Rector, M. D.

Dr. Rector of the American Society for the Control of Cancer will speak on the recent advances that medicine has made in the field of cancer research, and will give a resume of its history.

Illustrated

December 13—Poisonous Snakes and Treatment of Snake Bite.

Dr. Howard K. Gloyd

Dr. Gloyd, Director of the Academy, will discuss the several species of poisonous snakes in the United States, and the problems connected with the treatment of their bites.

Illustrated

December 20—A Summer in Old Mexico.

Dr. Charles Seevers

Dr. Seevers and his wife followed the new Pan-American Highway to Mexico City and south into the Mexican tropics, collecting natural history specimens along the way. He will talk of the country and people of this interesting Republic.

Illustrated

STAFF ACTIVITIES

This year the Academy has again cooperated with the Illinois State Natural History Survey in photographing both the beneficial work of the Survey in relation to agriculture and fisheries, and the fauna and flora of the state. President Dickinson or Earl G. Wright went into the field with Survey men at frequent intervals to photograph the progress of work which is being carried on under the admirable leadership of Dr. Theodore H. Frison, Chief of the Survey.

Last spring, Captain L. R. Wolfe invited Roy V. Komarek to accompany him on a collecting trip to the west, which made possible the addition of over a hundred desirable specimens to the study collections of the Academy. They were afield two weeks, spending most of the time in the vicinity of Cheyenne, Wyoming, northeastern Colorado, and southwestern Nebraska, collecting mammals and studying the nesting habits of some of the hawks of these states. Captain Wolfe had previously been stationed at Ft. Warren, near Cheyenne, and was consequently well acquainted with the region, so that collecting and studying could be confined to the most favorable localities, and much was accomplished in the relatively short stay. Among the more interesting mammals secured was a small rodent similar to our common meadow mouse, known as *Lagurus*, which lives at rather high altitudes and is quite rare in museum collections.

Walter L. Necker represented the Academy at the annual meeting of the American Society of Ichthyologists and Herpetologists which was held at the Museum of Zoology of the University of Michigan, August 31 and September 1. He took advantage of the admirable facilities of the museum to study some specimens and to continue his work on a personal project of an index to the world literature of reptiles and amphibians, for which over thirty thousand cards have been made to date. The courtesies extended by members of the University of Michigan to Mr. Necker are greatly appreciated.

Earl G. Wright represented the Academy at the annual meeting of the American Ornithologists' Union, held at the Carnegie Museum in Pittsburgh, October 19-22. He then took a twenty-five hundred mile trip to visit some of the eastern museums and to study their methods, also taking a side trip through the Shenandoah National Park. Walter A. Weber, who has been very helpful to the Academy in the past, and whose duties have kept him in Washington for the past six months, was Mr. Wright's cordial host in that city. The impressive Smithsonian Group, including the National Museum, National Art Gallery, and the Freer Art Gallery, received most of Mr. Wright's attention. The Philadelphia Academy of Natural Sciences, with its marvelous Panda and Okapi groups, and the American Museum of Natural History, were visited but without sufficient time to do them proper justice. Bear Mountain Park, truly a model for trail-side museums, is operated by the American Museum, in a beautiful area adjacent to the Hudson River. Bill Carr, Curator, with the cordiality so characteristic of the entire institution, showed Mr. Wright through the several buildings and along the nature trails and sanctuaries surrounding the museum. No "stuffed" animals attracted the half million visitors this past summer, for only the real, live animals are on exhibition. The West Point Military Academy Museum, and the most notable of state museums, the New York State Museum both offered much material of interest. The former probably little known, but having an incomparable collection of arma-

ments, the latter well known, locally for its exhibitions, and internationally for the scientific work of its staff, inspired by a former Chicagoan, Dr. C. C. Adams. An interesting trip through the Ithaca Gun Company Plant was made possible by Lou Smith, Vice-President, to whom the Academy and its staff are very much indebted for past favors. A regrettably short, but none the less impressive, visit was paid the Buffalo Museum, pioneer in the Children's Museum Idea, and plans for a more extensive visit are being made. Throughout most of the trip Mr. Wright unfortunately was in poor health and the condition was aggravated during the latter part, necessitating an early return to Chicago. These unfortunate circumstances allowed only a short time at the Royal Ontario Museums at Toronto to discuss the vital subject of teaching exhibits with the affable Mr. Snyder of the Museum of Zoology.

THE REPTILES OF NORTH AMERICA

By RAYMOND L. DITMARS

The numerous queries received at the museum for a popular book on reptiles of our country, have had to be answered very hesitatingly during the past few years since most accounts of these animals that pretended to be popular were either out of print or out of date, or too unusable to be recommended. Doubleday, Doran & Company, however, have just published *The Reptiles of North America* by Raymond L. Ditmars, which is the only book on North American reptiles which *can* be recommended to lay readers. It is a large book, of nearly five hundred pages plus 135 plates, printed in a beautifully clear and readable type. The contents of the book is essentially that of Dr. Ditmars' *Reptile Book*, published in 1907, but with nomenclature brought up to date, errors corrected, and new data added. It must be remembered, of course, that zoology in general, and herpetology in particular, is a *living* subject, that the past thirty years have added an immense amount of information on the natural history of animals, and certainly as much, if not more, has been learned about reptiles than any other class of animals. But not only has our knowledge gained, but also our uncertainty about much that previously was considered solid fact! In general, Dr. Ditmars has chosen to present one side of controversial matters, or has ignored them altogether. This is probably the main criticism of the herpetologist, but perhaps unjustified if the object of the book is considered; after all, even University courses, to supposedly well trained groups, are treated in the same manner!

Most of the species are illustrated by good, large photographs; the written treatment of each species includes description (pattern, coloration, dimensions), distribution, and habits, and in some cases, relationship and more technical considerations. The habits are largely restricted to Dr. Ditmars' personal observations, and primarily on captive material, so that much information on how to care for the various species is included. Experience with individual specimens often leads to long but interesting narratives. As a book of general information for someone beginning the study of reptiles, or for someone just mildly interested and curious, *The Reptiles of North America*, will be an excellent source and make good reading; the professional herpetologist also, will find many things published nowhere else.

W. L. N.

AVAILABLE PUBLICATIONS OF THE ACADEMY

During the past year there have been many requests for our publications, and many have become out of print in that time. The following are the only ones still available for sale or exchange. The Academy will be glad to recommend books on any natural history subject on request from its members.

Geology

- Glacial Markings of Unusual Forms in the Laurentian Hills. By Edmund Andrews. 1883. Bulletin, vol. I, no. 1. 9 pages, 7 figures. Price 25 cents.
- Observations of Fluvial Deposits in Peoria Lake, Illinois. By Joseph D. Wilson. 1883. Bulletin, vol. I, no. 2. 10 pages, 3 plates. Price 25 cents.
- Report of the Committee on the Microscopic Organisms in the Boulder Clays of Chicago and Vicinity. By H. A. Johnson and B. W. Thomas, Committee. 1883. Bulletin, vol. I, no. 4. 8 pages, 8 figures. Price 25 cents.
- Boulder Clays. On the Microscopic Structure of Certain Boulder Clays and the Organisms contained in them. By George M. Dawson. 1885. Bulletin, vol. I, no. 6. 14 pages, 3 figures. Price 25 cents.
- Chicago Artesian Wells. On their Structure and Sources of Supply. By Leander Stone. 1886. Bulletin, vol. I, no. 8. 12 pages, 2 figures. Price 25 cents.
- The Pleistocene Features and Deposits of the Chicago Area. By Frank Leverett. 1897. Bulletin of the Natural History Survey, vol. II. 87 pages, 8 figures. Price 50 cents.
- The Mineralogy of the Chicago Area. By Alja Robinson Crook. 1902. Bulletin of the Natural History Survey, vol. V. 57 pages, 21 figures, 10 plates. Price 50 cents.

Invertebrate Paleontology

- On Rhizocarps in the Erian (Devonian) Period in America. By Sir William Dawson. 1886. Bulletin, vol. I, no. 9, 17 pages, 12 figures. Price 25 cents.
- Crinoidea. The Paleontology of the Niagara Limestone in the Chicago Area. 1900. Bulletin of the Natural History Survey, vol. IV, part 1. 153 pages, 57 figures, 15 plates. Price 75 cents.
- Trilobita. The Paleontology of the Niagara Limestone in the Chicago Area. 1907. Bulletin of the Natural History Survey, vol. IV, part 2. 128 pages, 16 figures, 10 plates. Price 75 cents.

Reptiles and Amphibians

- List of Batrachia and Reptilia of Illinois. By N. S. Davis, Jr. and F. L. Rice. 1883. Bulletin, vol. I, no. 3. 10 pages. Price 25 cents.
- Contribution to the Herpetology of the Smoky Mountains of Tennessee. By Walter L. Necker. 1934. Bulletin, vol. V, no. 1. 4 pages. Price 10 cents.
- Reptiles and Amphibians of the Chicago Region. By Karl P. Schmidt and Walter L. Necker. 1936. Bulletin, vol. V, no. 4. 23 pages, 1 figure. Price 25 cents.

Birds

- Some suggestions on the Construction of Bird Houses. By Albert Stevenson. 1913. Bulletin, vol. IV, no. 1. 4 pages, 6 figures. Price 10 cents.
- The Birds of the Chicago Area. By Frank Morley Woodruff. 1907. Bulletin of the Natural History Survey, vol. VI. 221 pages, 11 plates. Price \$1.00.
- Birds of the Region of Point Barrow, Alaska. By Alfred M. Bailey, Charles D. Brower, and Louis B. Bishop. 1933. Program of Activities, vol. IV, no. 2. 28 pages, 4 figures. Price 25 cents.
- Birds of the Chicago Region. By Edward R. Ford, Colin C. Sanborn, and C. Blair Courson. 1934. Program of Activities, vol. V, nos. 2-3. 64 pages, 9 figures. Price 50 cents.
- The Birds of Kodiak Island, Alaska. By Herbert Friedmann. 1935. Bulletin, vol. V, no. 3. 42 pages, 1 figure. Price 50 cents.

The Illinois Audubon Society has for sale, in the office of the Academy, a selection of bird books, as well as the publications of the National Association of Audubon Societies and the Bulletin of the Illinois Audubon Society.

Shells

- Preliminary Outline of a new Classification of the Family Muricidae. By Frank Collins Baker. 1895. Bulletin, vol. II, no. 2. 23 pages. Price, 25 cents.
- The Gross anatomy of *Limnaea emarginata* Say, var. *mighelsi*, Binney. By Frank Collins Baker. 1900. Bulletin, vol. II, no. 3. 36 pages, 6 plates. Price 50 cents.
- The Digitations of the Mantle in Physa. Description of a new Species of *Limnaea*. By Frank Collins Baker. 1901. Bulletin, vol. II, no. 4. 12 pages, 2 plates. Price 25 cents.
- The Lymnaeidae of North and Middle America. By Frank Collins Baker. 1911. Special Publications, vol. III. 555 pages, 51 figures, 57 plates. Price \$5.00.
- The Mollusca of the Chicago Area. By Frank Collins Baker. The Pelecypoda. 1899. Bulletin of the Natural History Survey, vol. III, part 1. 130 pages, 27 plates. Price \$1.00.
- The Gastropoda. 1902. Bulletin of the Natural History Survey, vol. III, part 2. 110 pages, 7 plates. Price \$1.00.

Botany

- The Northern Pitcher-Plant, or the Side-Saddle Flower, *Sarracenia purpurea*, L. By William K. Higley. 1885. Bulletin, vol. I, no. 5, 16 pages, 2 figures. Price 25 cents.
- The Lichen-Flora of Chicago and Vicinity. By William W. Calkins. 1896. Bulletin of the Natural History Survey, vol. I. 51 pages. Price 25 cents.
- An Annotated Flora of the Chicago Region. By Herman S. Pepon. 1927. Bulletin of the Natural History Survey, vol. VIII. 576 pages, 139 halftones, 7 maps. Price, bound, \$3.50.
- Supplement to An Annotated Flora of the Chicago Area by H. S. Pepon. By Carl A. Buhl. 1934. Bulletin, vol. V, no. 2. Price 10 cents.

Mushrooms

The Higher Fungi of the Chicago Region. By Will Sayer Moffatt. The Hymenomycetes. 1909. Bulletin of the Natural History Survey, vol. VII, part 1. 156 pages, 24 plates. Price \$1.00

The Gastromycetes. 1923. Bulletin of the Natural History Survey, vol. VII, part 2. 24 pages, 26 plates. Price 50 cents.

Mushrooms of the Chicago Region. By Verne O. Graham. 1933. Program of Activities, vol. IV. 24 pages, 45 figures. Price 25 cents.

Miscellaneous

The Atwood Celestial Sphere. By Wallace W. Atwood. 1913. Bulletin, vol. IV, no. 2. 32 pages, 6 figures. Price 10 cents.

The Dunes of the Chicago Region. By V. O. Graham, Walter L. Necker, E. V. Komarek, D. C. Lowrie, Norman Bergendahl, and Edward R. Ford. 1935. Program of Activities, vol. VI, no. 2. 20 pages, 8 figures. Price 20 cents.

Mammals of the Chicago Region. By Tappan Gregory. 1936. Program of Activities, vol. VII, nos. 2-3. 64 pages, 23 figures. Price 50 cents.

WILSON CLUB AND INLAND BIRD BANDERS WILL MEET AT THE ACADEMY

The Annual Meetings of the Wilson Ornithological Club and of the Inland Bird Banding Association will be held at the Academy on November 27 and 28, respectively. An interesting series of papers is expected for both days, and everyone interested in birds is urged to be present to hear the papers and meet their fellow-bird students from throughout the middlewest. Everyone interested in the work of these two Societies is also invited to attend the annual Banquet. We urge our members to call the Academy before the meetings for further information which is not yet available.

NEW CASES FOR CHICAGO PARK DISTRICT

The Academy, cooperating with the Chicago Park District, is planning a series of exhibits for the various field houses of the Chicago Parks. Five Works Progress Administration Employees have been transferred to the Academy for this project, and are working under Mr. Wright's direction. It is the intention to show the common animals and plants of the Chicago Region, so that knowledge of the interesting fauna and flora of our environs might have a wider dissemination. We hope to have an encouraging report of progress for the next *Program* on this vital new activity of the Park District and the Academy.

INDIAN AGRICULTURAL RESEARCH
INSTITUTE LIBRARY, NEW DELHI.

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